14 December 2018
University of Northumbria

Superwood

How forestry and timber can drive a low-carbon economy

Session 3
Building more, and more creatively, with wood

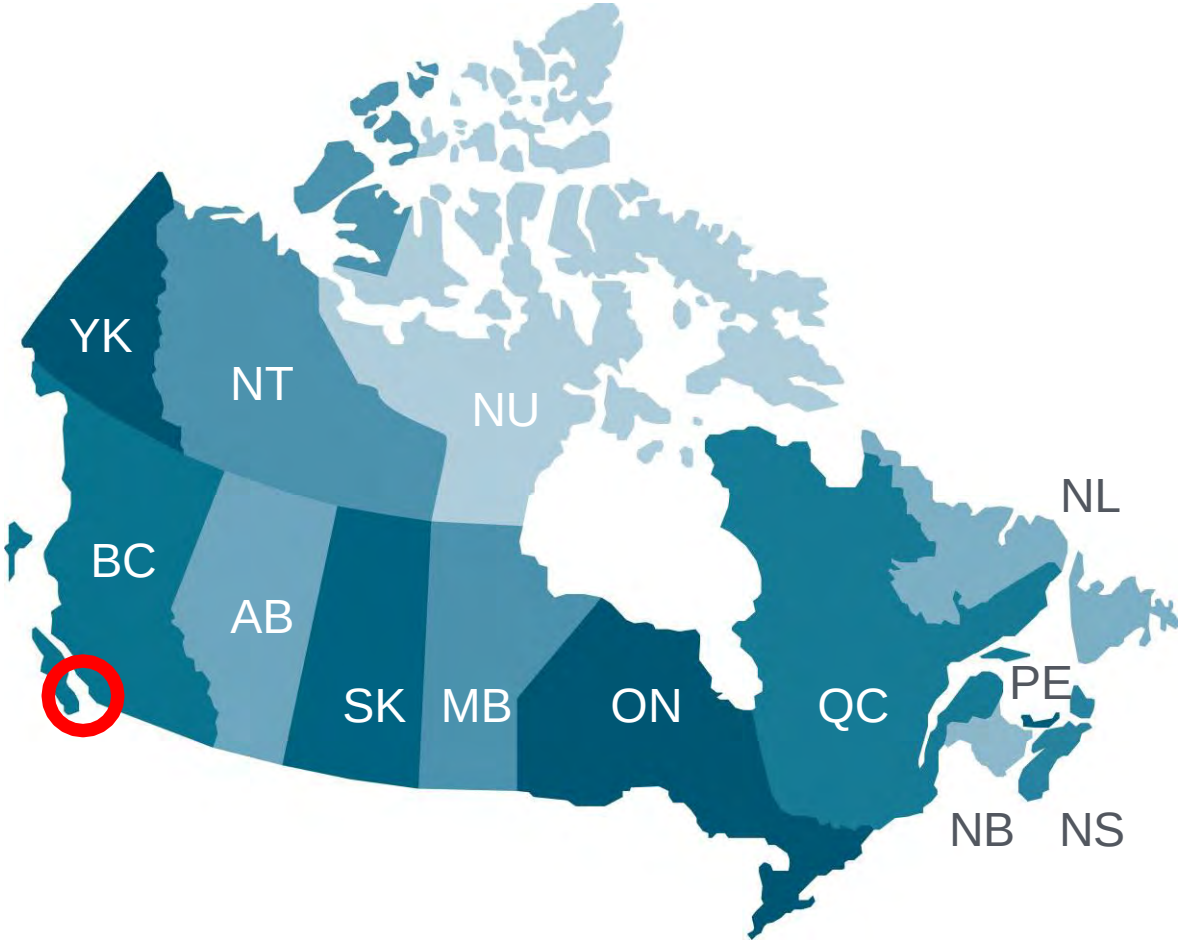
#Superwood

Ryder

Lessons from British Columbia

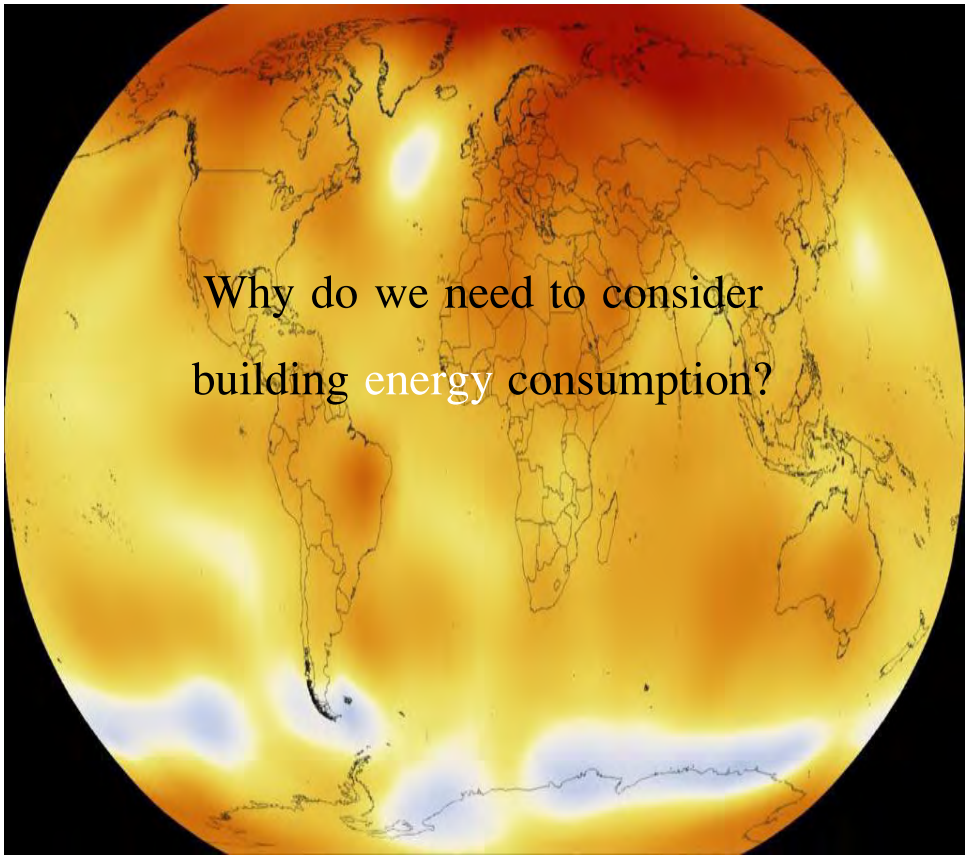
A high-performance, wood-based building industry to drive a low-carbon economy

Ryder



Ryder


Italy
Japan
France
Nicaragua
Cambodia
Germany
Uruguay
United Kingdom
Sweden
South Korea
Cameroon
Canada's forest area



408ppm C02eq

UN CLIMATE CHANGE CONFERENCE – PARIS COP21 2015

CO_2-eq Concentrations in 2100 ($ppm\ CO_2$-eq) [f] Category label (conc. range)	Subcategories	Relative position of the RCPs [d]	Change in CO_2-eq emissions compared to 2010 (in %) [c]		Likelihood of staying below a specific temperature level over the 21st century (relative to 1850–1900) [d, e]			
			2050	2100	1.5°C	2°C	3°C	4°C
450 (430 to 480)	Total range [a, g]	RCP2.6	–72 to –41	–118 to –78	More unlikely than likely	Likely	Likely	Likely
500 (480 to 530)	No overshoot of 530 ppm CO_2-eq	RCP2.6	–57 to –42	–107 to –73	Unlikely	More likely than not	Likely	Likely
	Overshoot of 530 ppm CO_2-eq	RCP2.6	–55 to –25	–114 to –90	Unlikely	About as likely as not	Likely	Likely
550 (530 to 580)	No overshoot of 580 ppm CO_2-eq	RCP2.6	–47 to –19	–81 to –59	Unlikely	More unlikely than likely [i]	Likely	Likely
	Overshoot of 580 ppm CO_2-eq	RCP2.6	–16 to 7	–183 to –86	Unlikely	More unlikely than likely [i]	Likely	Likely
(580 to 650)	Total range	RCP4.5	–38 to 24	–134 to –50	Unlikely	More unlikely than likely [i]	Likely	Likely
(650 to 720)	Total range	RCP4.5	–11 to 17	–54 to –21	Unlikely	Unlikely	More likely than not	Likely
(720 to 1000) [b]	Total range	RCP6.0	18 to 54	–7 to 72	Unlikely [h]	Unlikely	More unlikely than likely	Likely
>1000 [b]	Total range	RCP8.5	52 to 95	74 to 178	Unlikely [h]	Unlikely [h]	Unlikely	More unlikely than likely

Table SPM.1 Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA

PARIS CLIMATE CONFERENCE – COP21 2015

Agreement to target climate change temperature increase to 1.5 degrees

Low Carbon Buildings Innovation Program

Starting in 2019, the Province will offer new incentives for builders, developers and manufacturers to stimulate the development and demonstration of innovative, low-carbon building solutions. The Low Carbon Buildings Innovation Program will accelerate the availability, acceptance and affordability of high performance solutions such as advanced building designs, advanced construction methods and ultra-efficient building components.

Funding will be available for projects in three categories, through bi-annual competitive calls:

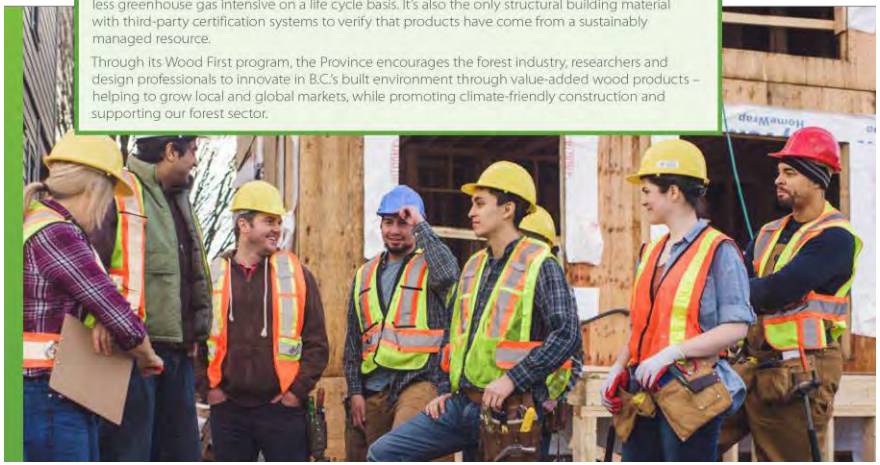
- Research – building solutions that show promise but may require further innovation before being commercialized (e.g. vacuum insulated wall panels and windows, natural gas heat pumps);
- Commercialization – building solutions that have been tested and are ready to be scaled up for wider application (e.g. high-performance prefabricated external insulation systems); and
- Demonstration – building solutions currently available in the marketplace that require demonstration to build industry capacity and public acceptance (e.g. such as net-zero energy ready construction).

Along with stimulating the development of new ideas, the program will prove to the market that existing technologies work and deliver their intended benefits. This will increase the capacity of B.C.-based industries, generate consumer confidence, and help to lower the costs of new technologies and building approaches over time.

WOOD FIRST

B.C. wood is a natural choice for low carbon building. Wood is the only building material grown by sunlight, with a lighter carbon footprint than other common building materials, and is much less greenhouse gas intensive on a life cycle basis. It's also the only structural building material with third-party certification systems to verify that products have come from a sustainably managed resource.

Through its Wood First program, the Province encourages the forest industry, researchers and design professionals to innovate in B.C.'s built environment through value-added wood products – helping to grow local and global markets, while promoting climate-friendly construction and supporting our forest sector.



“ A partnership between the primary industry, manufacturers and the provincial and federal governments”

Principal Activities

Building Codes, Design Standards, Regulations

Technical Information and Transfer

Current and future practitioner education

Recognition Programmes

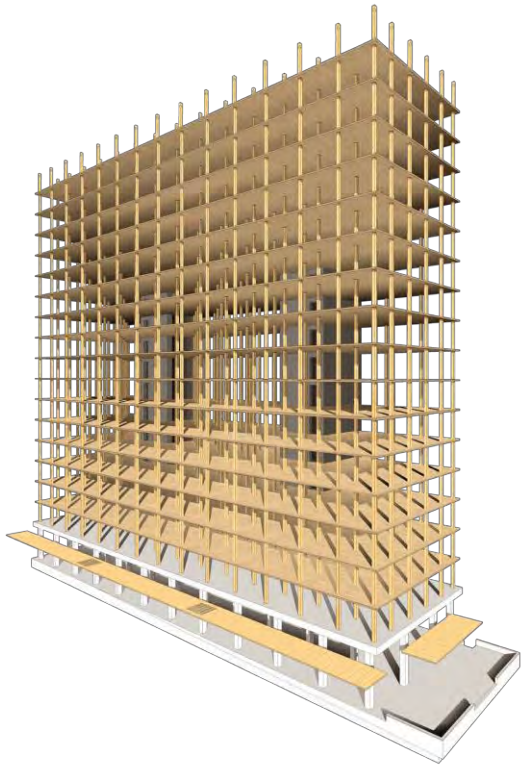
Communications

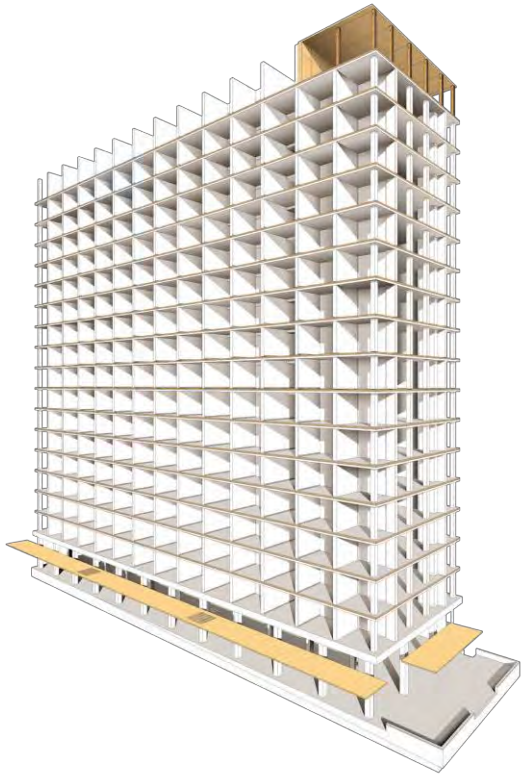
Since 1998

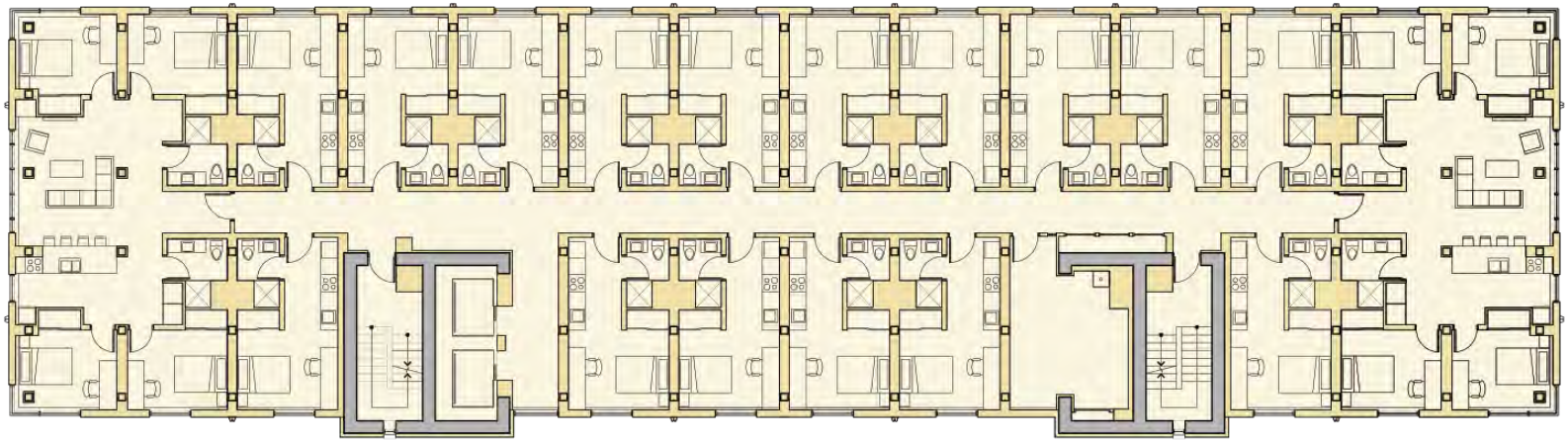
Directly influence 1800 project

Incremental wood sales of $1.1 Billion

Annual Goals 2017	Achieved
235 projects influenced	238
128 million bd. ft. equiv. (lumber)	126
$151 million in wood sales	$163
45,000 education hours	47,500
19,500 construction professionals reached	20,100
Implemented Education Plan	✓
Initiated Low-Rise Commercial Buildings Program	✓
Supported Tall Wood Buildings EOI	✓
Mid-Rise - Built or at Design/Conceptual Stage	585





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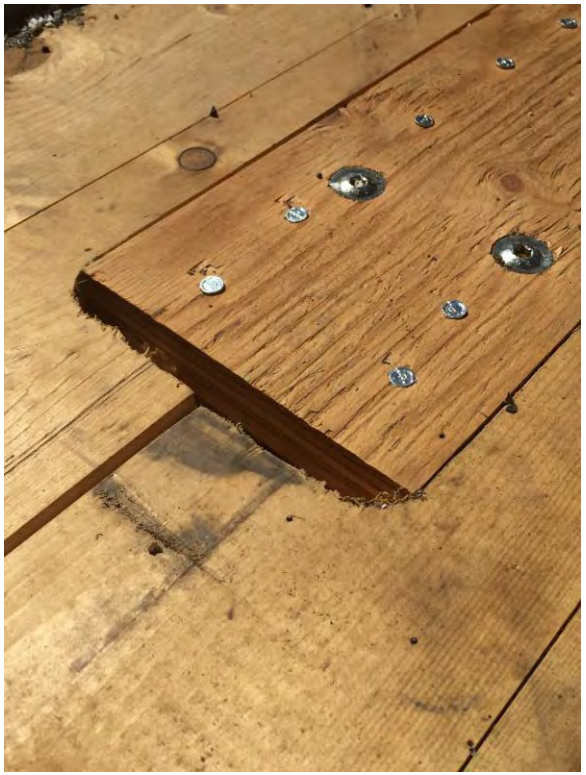

amenity

Ryder

Everything architecture

$uperwood

Lessons from Scotland

Neil Sutherland MAKAR

MAKAR


MAKAR
• 150 home deliveries
• 25+ years
• 35 people
• 15 - 20 home deliveries / pa
• £3.5M turnover
MAKAR


MAKAR


MAKAR


MAKAR


MAKAR


MAKAR


MAKAR


MAKAR


MAKAR


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MAKAR


Timber Frame Housing
Scotland 80%
England & Wales 15%
MAKAR

Modern Suburbia: Anywhere / Everywhere

MAKAR

A New Standard in House Delivery and Place Making

- The 200 year house
- Energy Positive – generate more than used
- Carbon Negative – contributing to the solution
- Representing a Long-term, Quality Driven Agenda

MAKAR

OFFSITE SOLUTIONS

SCOTLAND

MAKAR

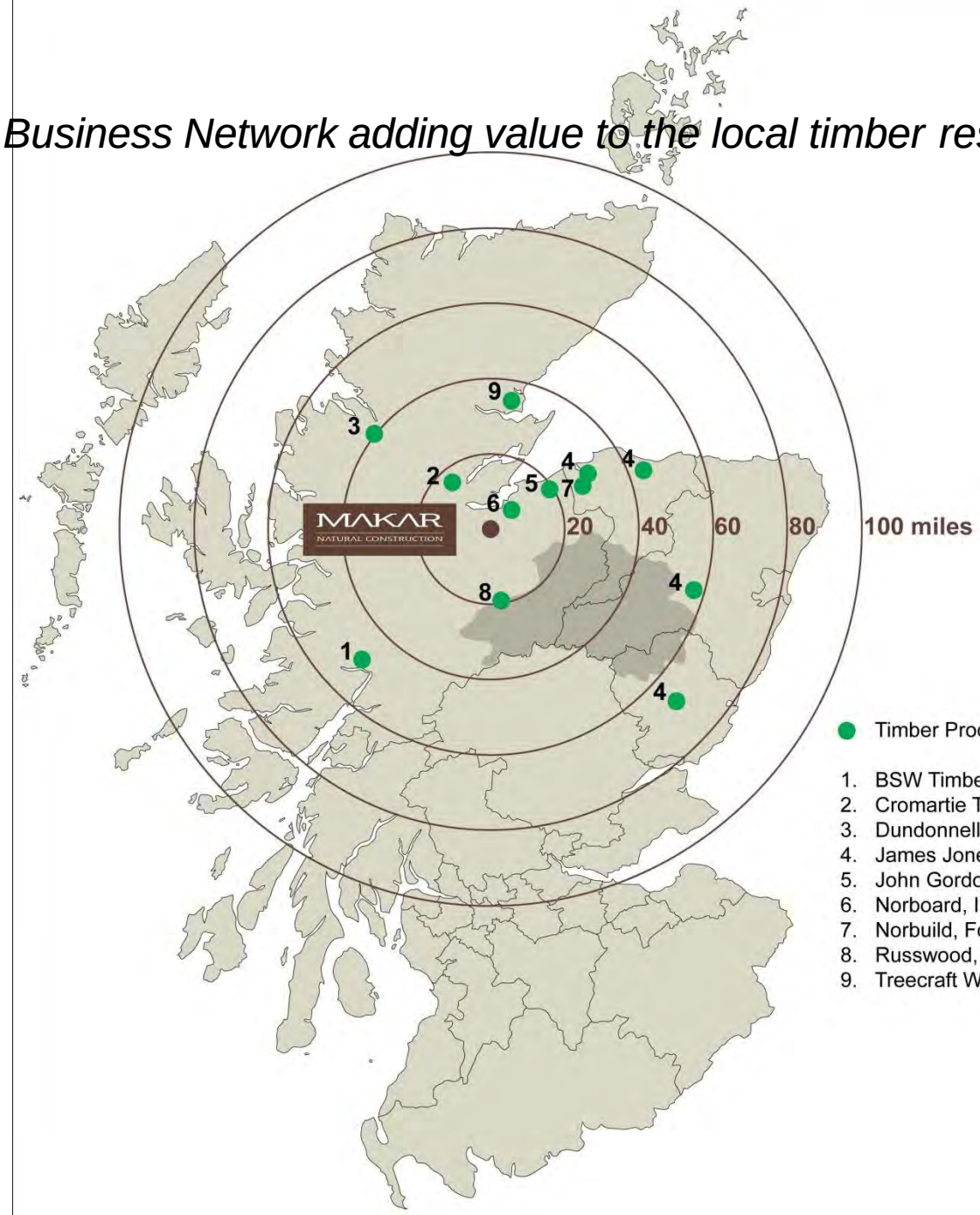

M792 WST
MANITOU
Respond to the Existing Resource
and Help Shape its Future
MAKAR

Timber & Timber Products

- **Four Commercial Softwood Species –**
  Pine, Spruce, Fir and Larch
- **We use several species per building**
- **Other minor Species: Hemlock, Cedar, Cyprus**

MAKAR

Business Network adding value to the local timber resource



Timber Product Suppliers

1. BSW Timber, Corpach
2. Cromartie Timber, Strathpeffer
3. Dundonnell Timber, Wester Ross
4. James Jones & Sons, various locations
5. John Gordon and Sons, Nairn
6. Norboard, Inverness
7. Norbuild, Forres
8. Russwood, Newtonmore
9. Treecraft Woodwork, Dornoch

MAKAR


MAKAR Workshop - 2012
MAKAR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MAKAR
NATURAL CONSTRUCTION
STANLEY
MAKAR


Wigluv
SIGA-IS
www.siga.ch
SIGA


MAKAR


Lass Plant Hire Ltd
MAKAR


Plant Hire Ltd
LAS
Plant Hire Ltd
MAKAR


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MAKAR

MAKAR


BREAD
MAKAR


Off-site delivered Housing:
- Sweden 60%
- Netherlands 25%
- Japan 20%
- UK, USA etc, less than 5%
MAKAR

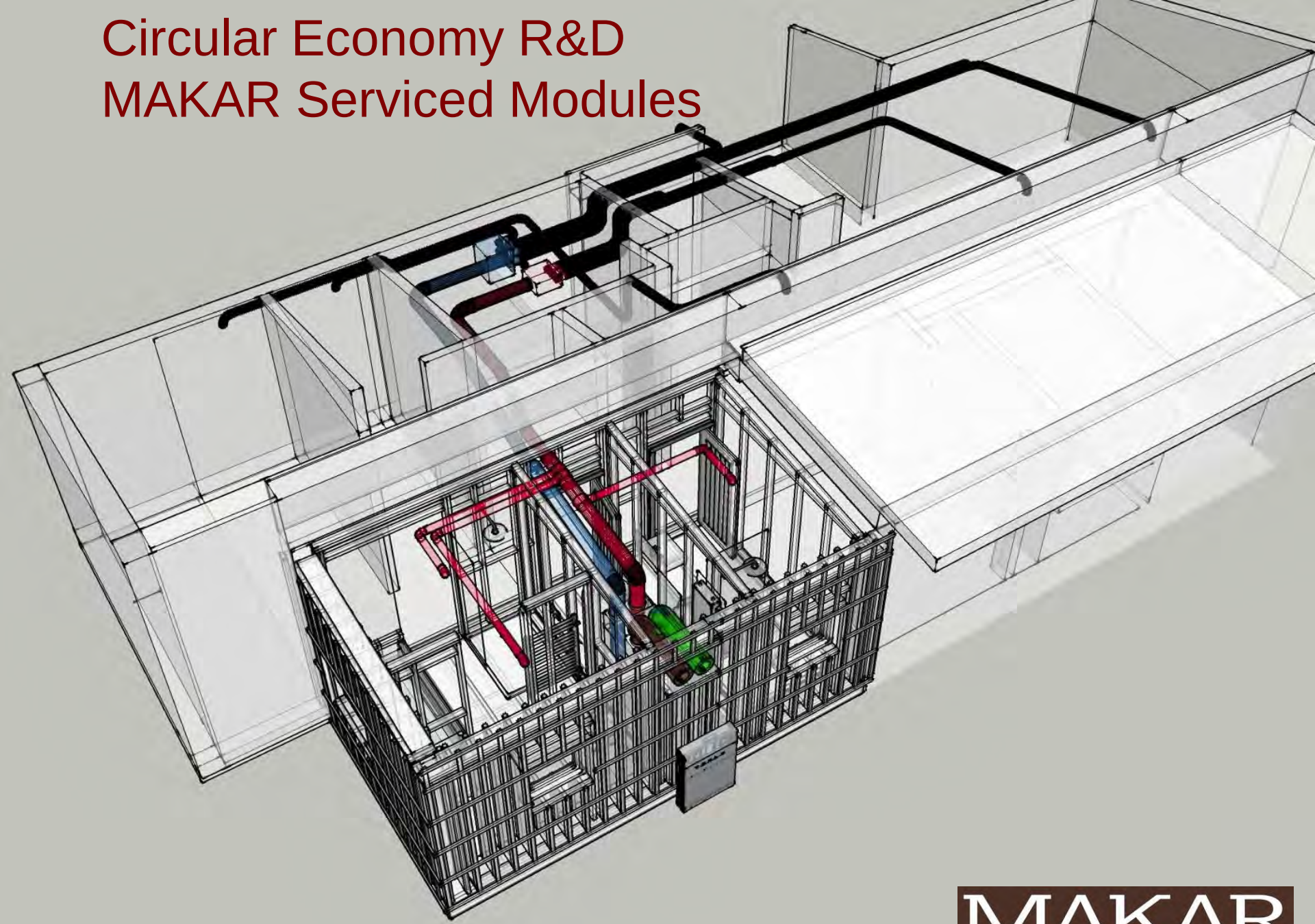

Timber Product Development
MAKAR

Timber Product & Process Development:

- Engineered Components; Glu-lam, CLT, Dowel-lam
- External & Internal Fit-out;
- Added Value Components; Modified timber, Wood Fibre Insulation etc
- Integrated Off-site &On-site Design & Delivery

MAKAR

Circular Economy R&D
MAKAR Serviced Modules



MAKAR


MAKAR


MAKAR


4 Homes at Fodderty, Dingwall - 2014
MAKAR

Carbon Measurement

- Innovate UK support, Partner UEA
- Energy and Carbon Assessment for a live project - Units 1 and 2 at Fodderty
- Creation of a lifecycle energy and carbon model that MAKAR can use for other live projects
- Carbon removed from the biosphere in the Project Delivery

MAKAR


MAKAR


MAKAR


MAKAR

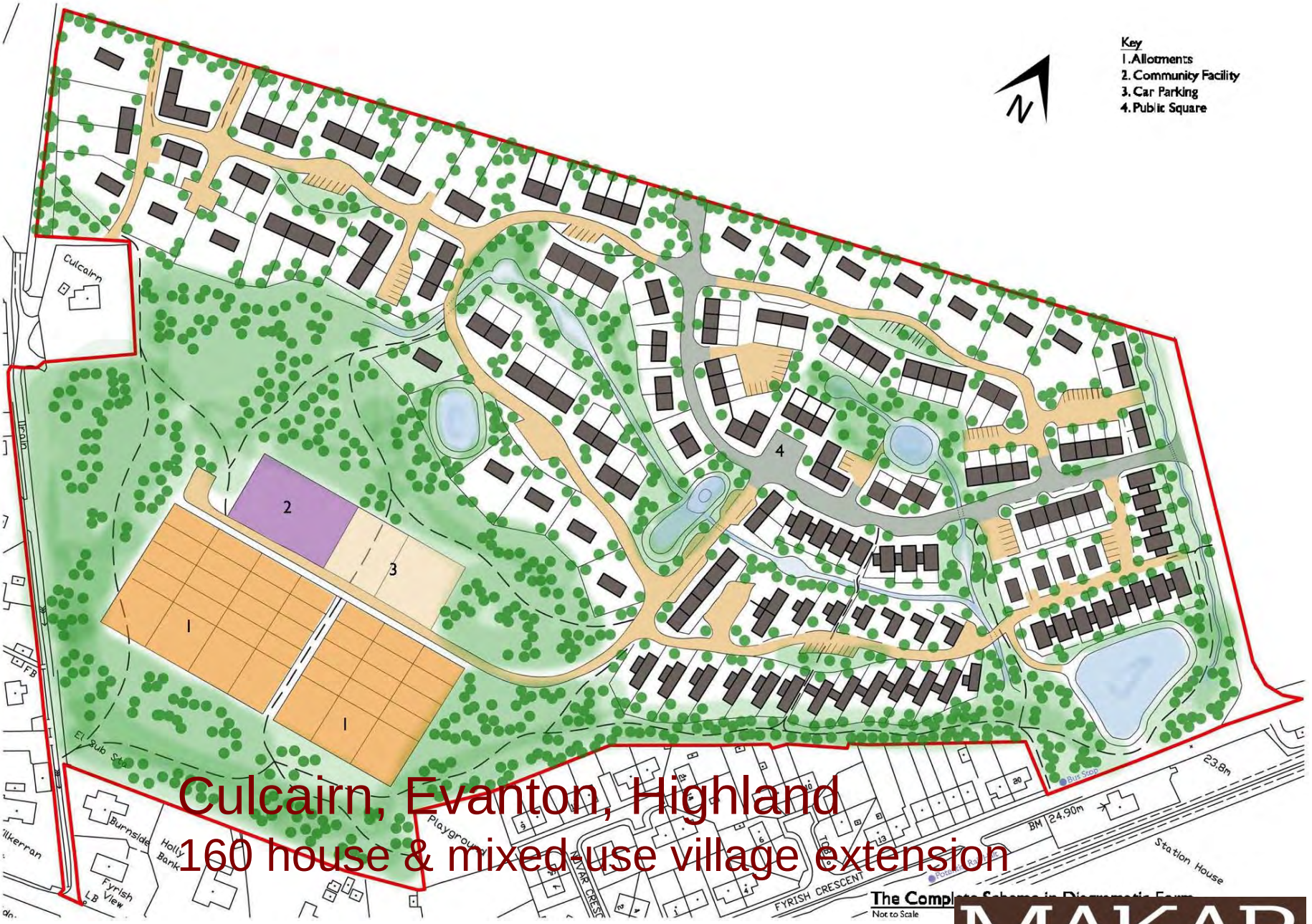

MAKAR


MAKAR

Forestry Hub – Grosvenor Estate, Delivery 2019

MAKAR


MAKAR



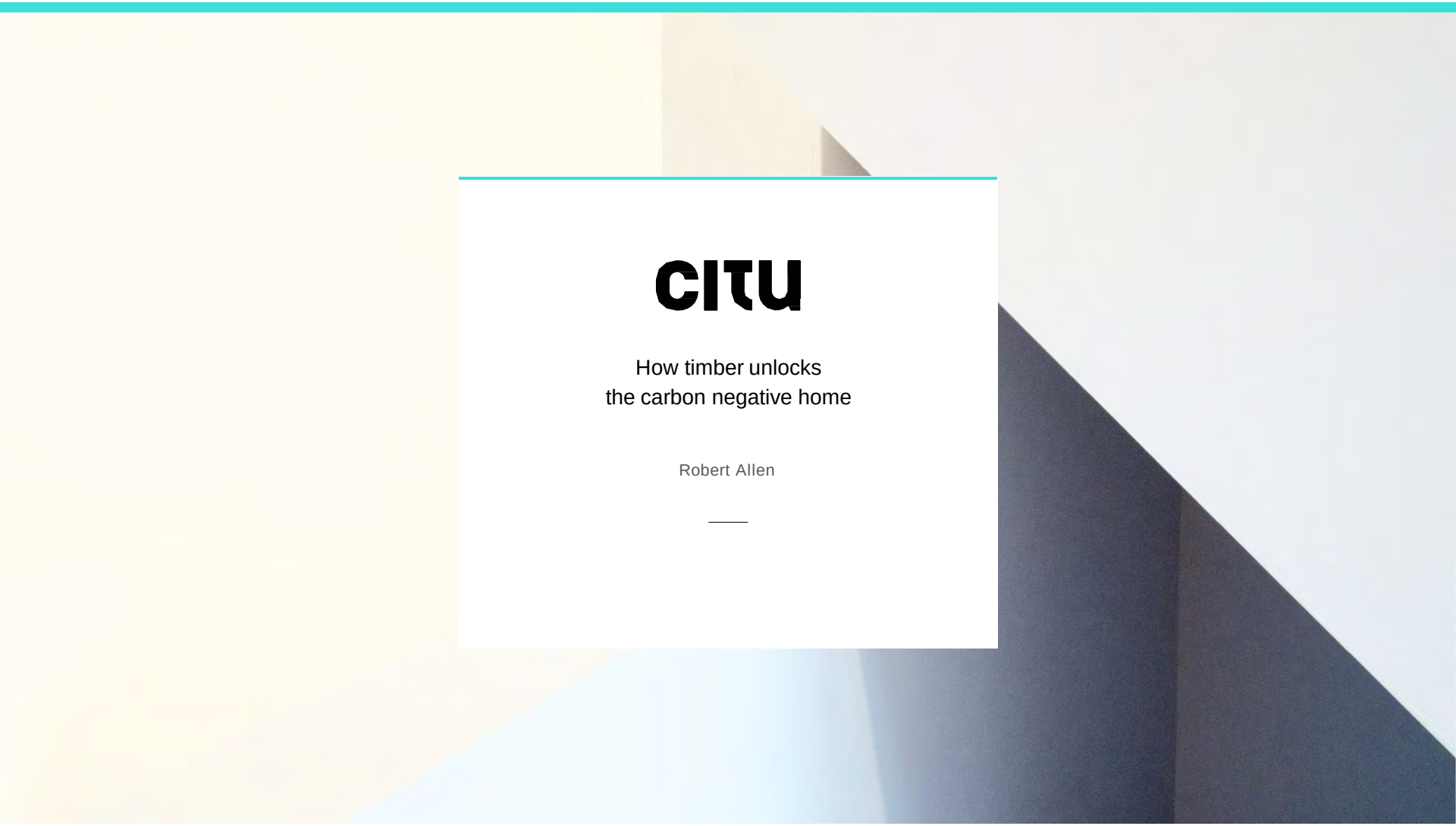
Culcairn, Evanton, Highland

160 house & mixed-use village extension


Economy, Authenticity & Modesty
the *Good Ordinary*
MAKAR

www.makar.co.uk
neil@makar.co.uk
@makarneil
@MAKARhomes

MAKAR

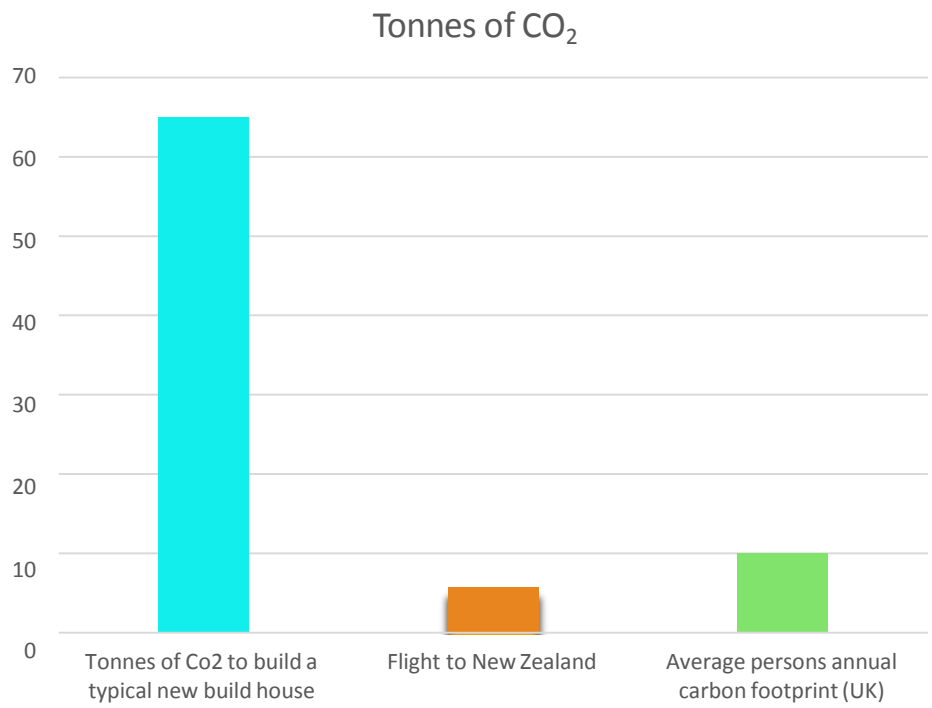


CITU

How timber unlocks the carbon negative home

Robert Allen

We need more homes. But they take a lot of CO_2 to build.



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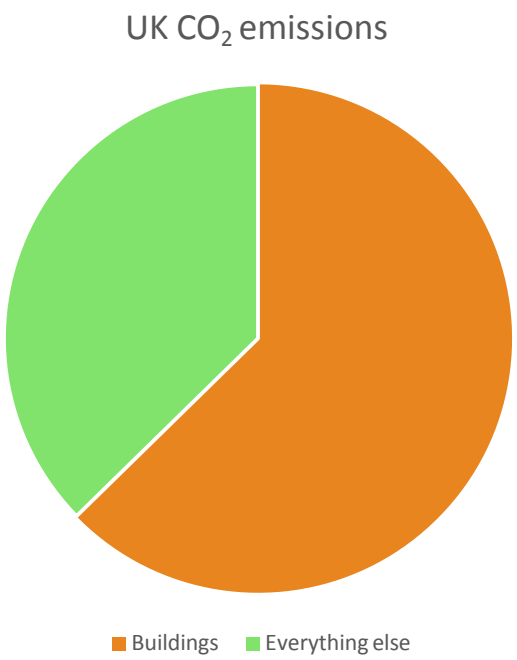
Buildings cause two thirds of the UK's CO_2 emissions.



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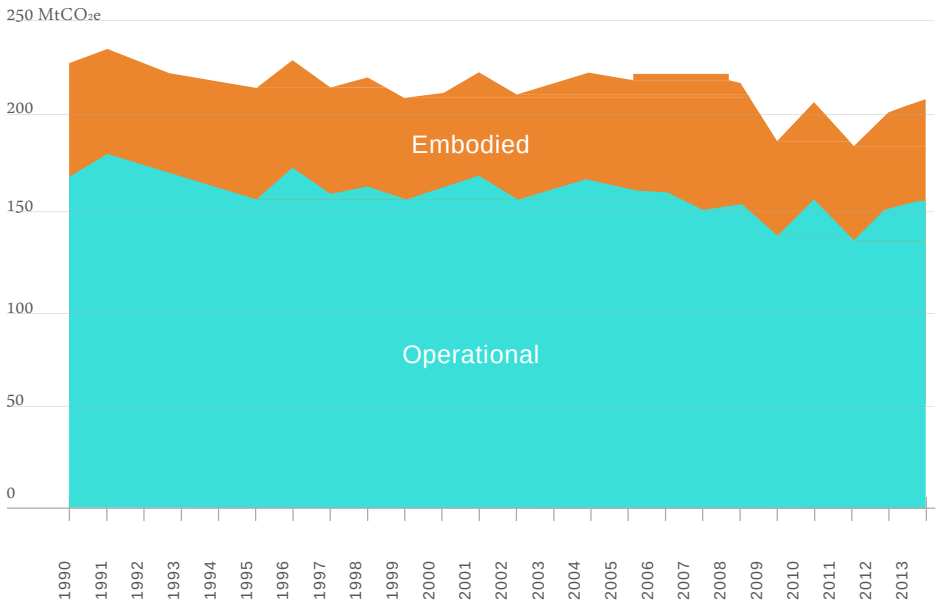
Building emissions aren't going down.

Built environment emissions 1990-2013



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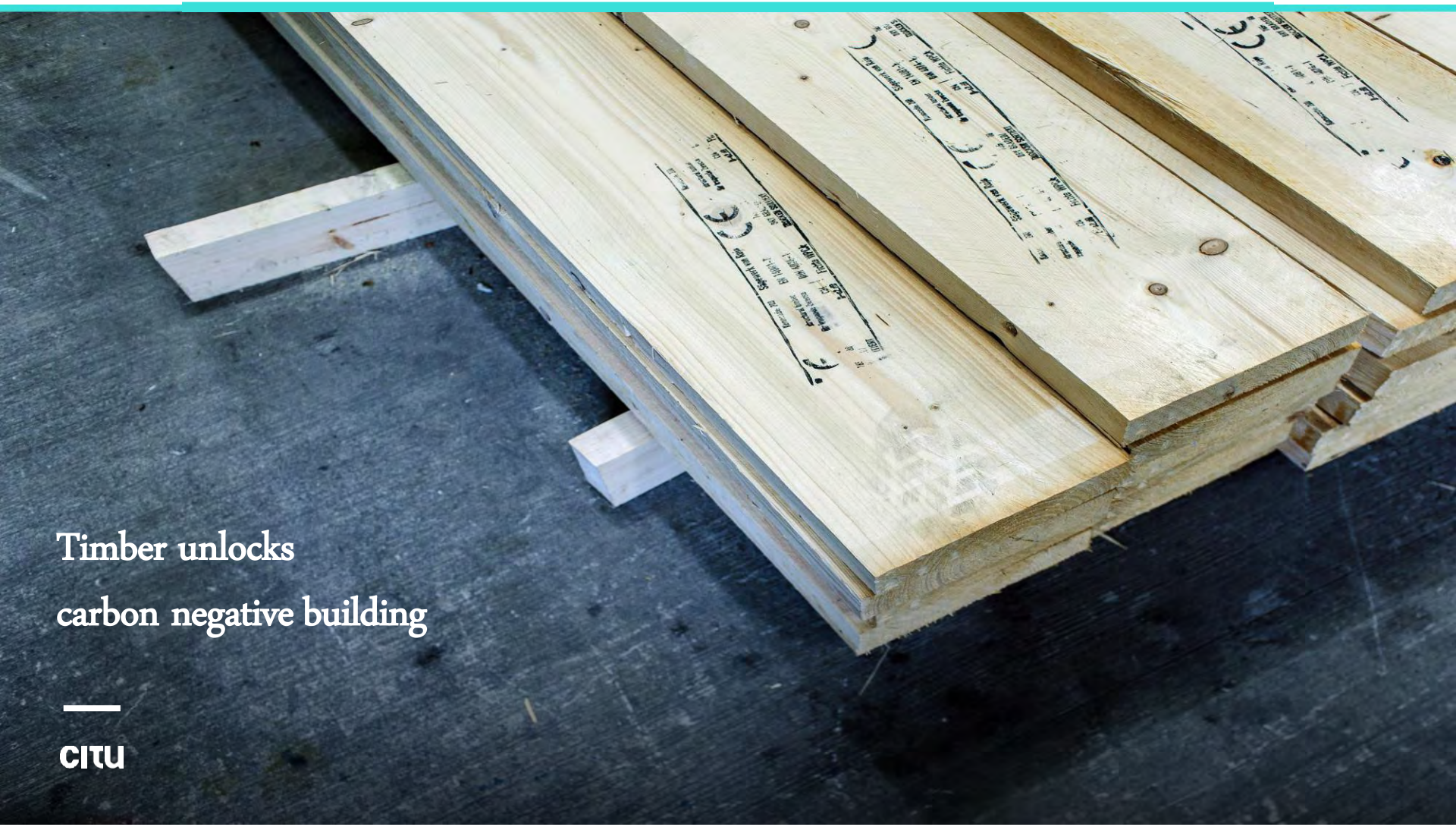
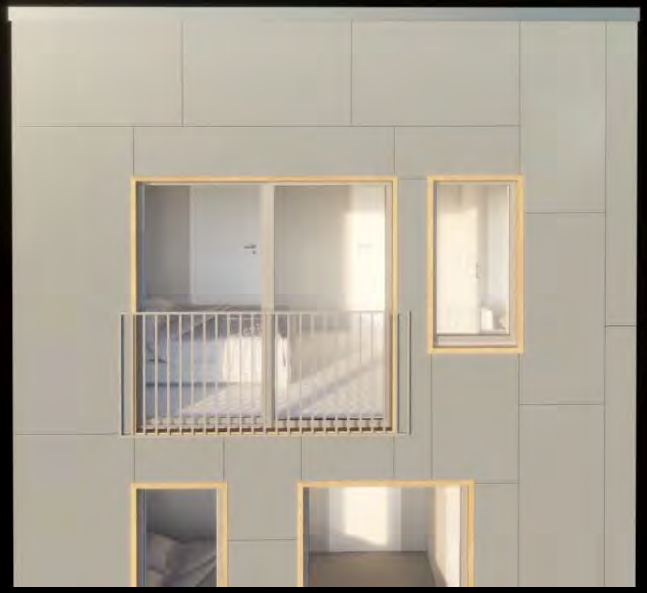


Timber unlocks carbon negative building

CITU

The Citu Home

Built to tackle the greatest challenge of our lifetime



World-changing design

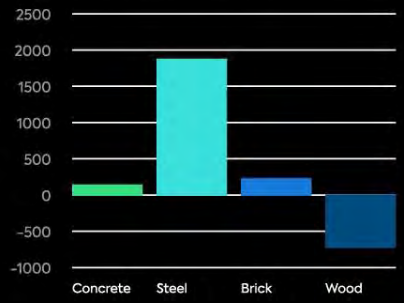
The Citu Home is designed for our time. It's built to tackle climate change and reduce the carbon emissions produced by the people who live in it. It combines Scandinavian design with the latest in sustainable technology, to create an incredible living space that is among the most energy-efficient houses in the world.

Timber frame. Built for the future

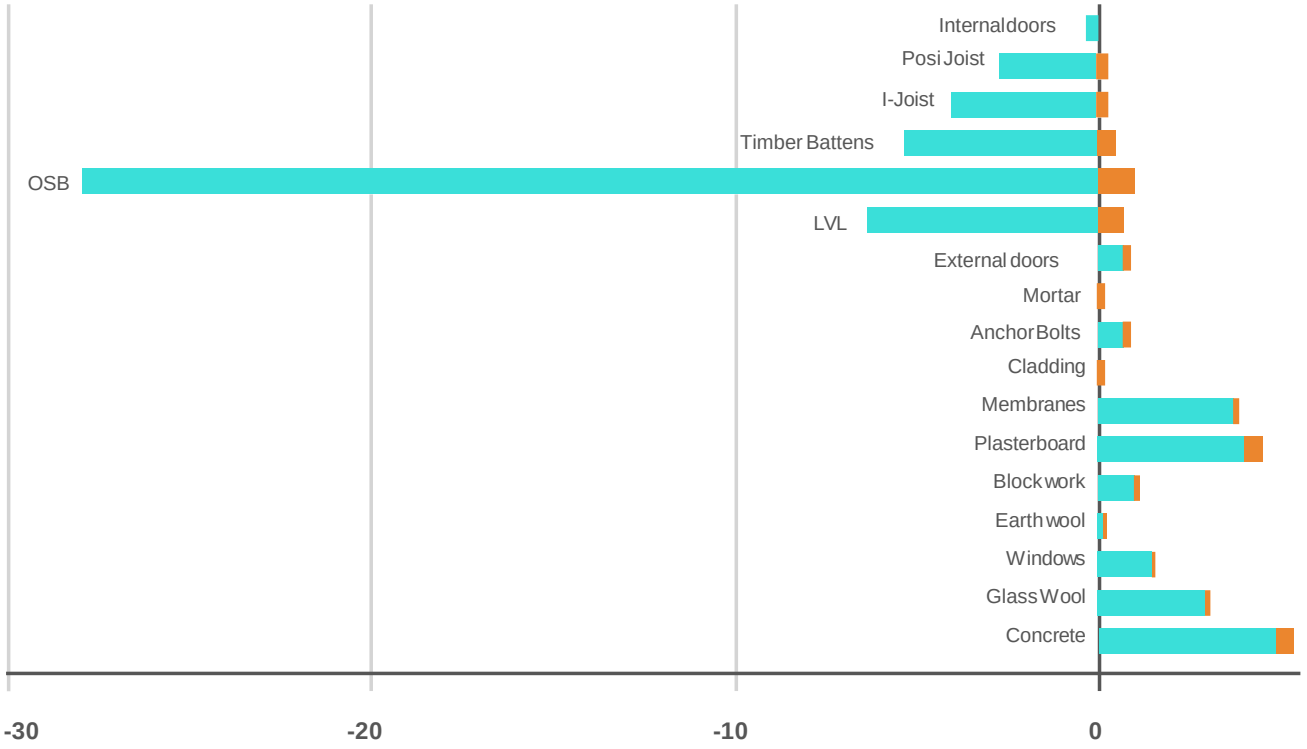
Strong, light and completely renewable, wood is a carbon negative material, storing one tonne of CO2 per cubic meter of wood used. Building any other way just isn't sustainable.

For every tree used
we plant 3 in its place

Kg of CO2 produced (or stored) to create each tonne of building materials



Tonnes of CO2 emitted/sequestered from production of raw materials and transport



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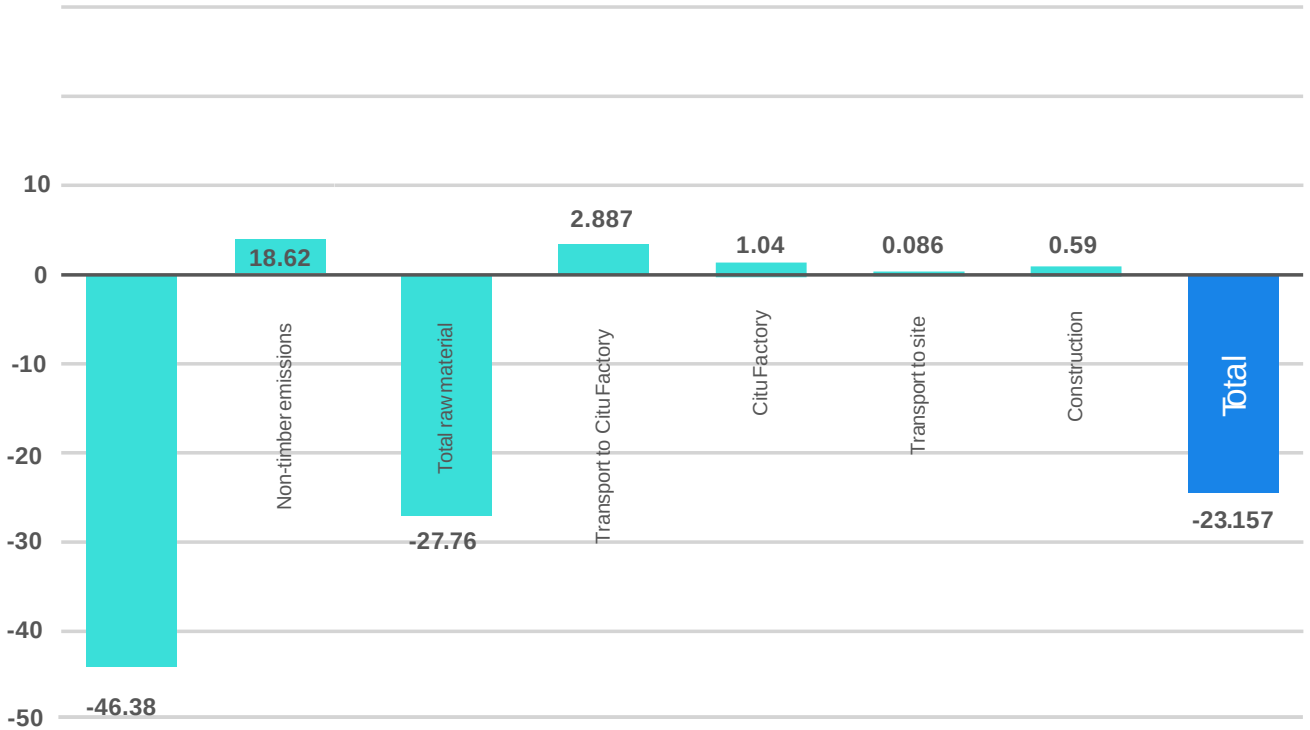
Embodies Carbon Emissions – Cradle to Practical Completion



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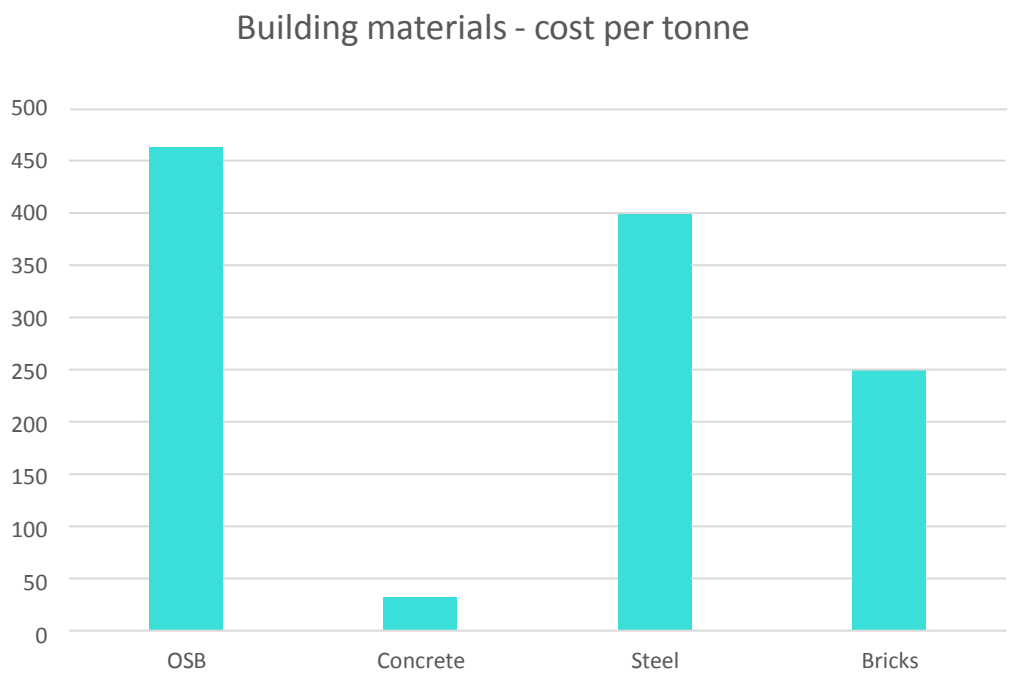
Delivering at scale

CITU

Putting a cost on carbon



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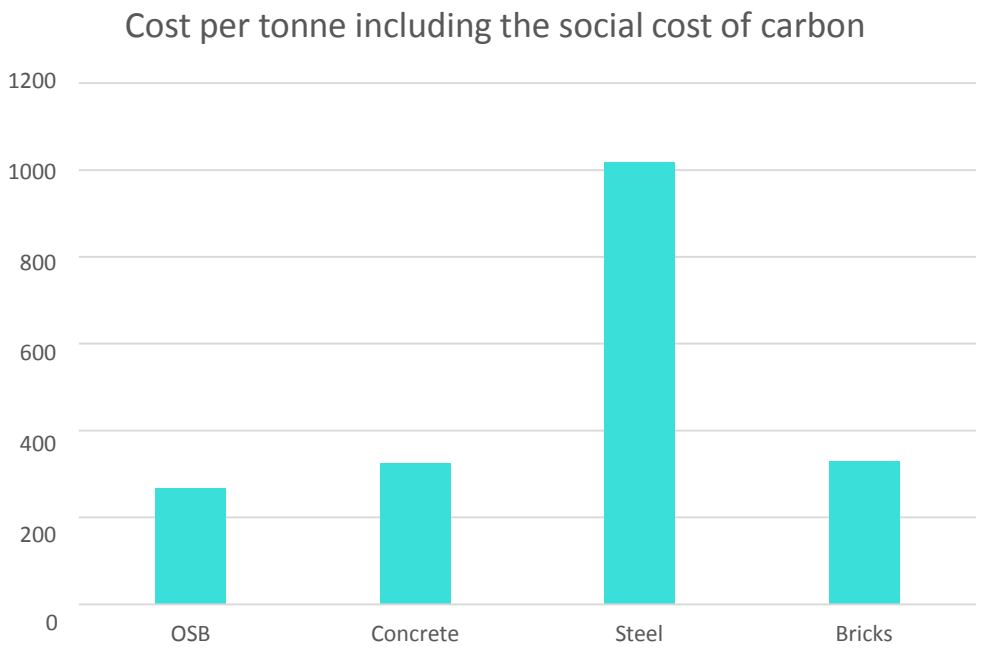
Creating a level playing field puts timber in the lead



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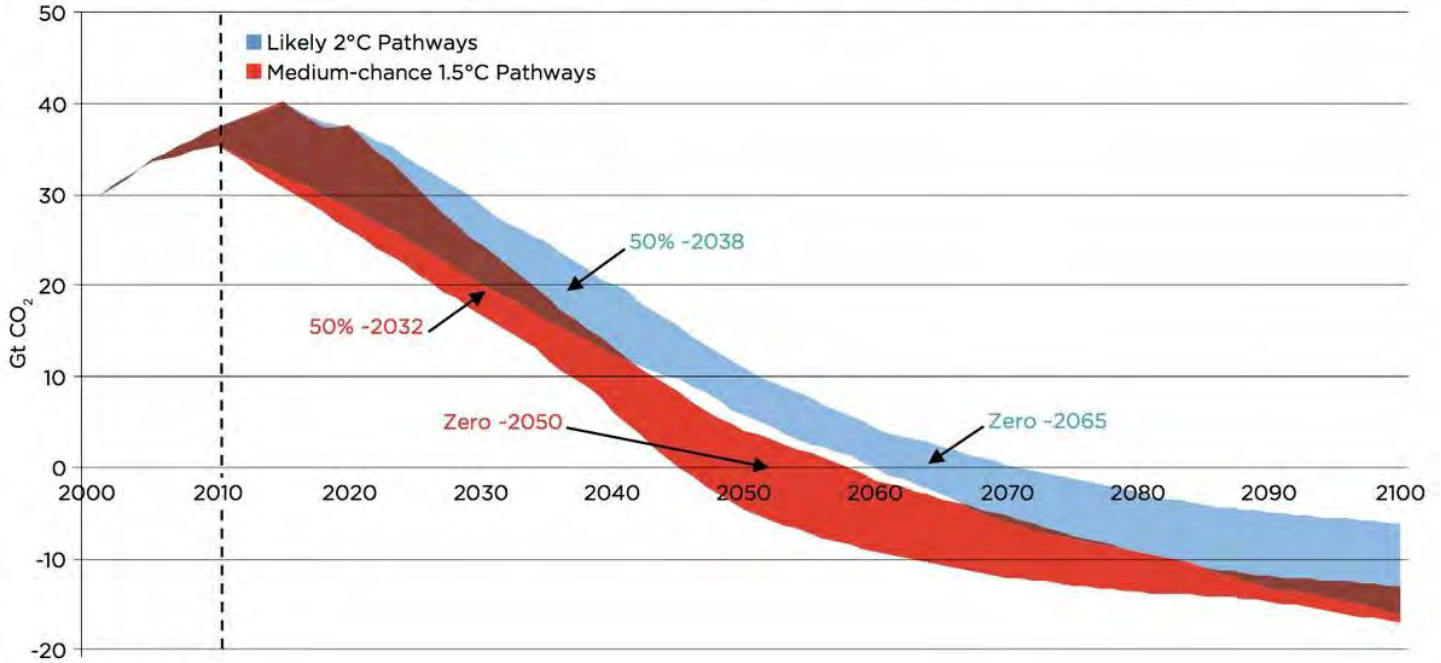
Buying time for BECCS:

Building with wood is a vital bridging technology to reaching a net zero carbon world

CITU

Negative emissions are required in order for us to meet our targets

Figure 1: Range of Global Emissions Pathways in Scenarios Consistent with Likely Chance of 2°C or Medium Chance of 1.5°C[18]



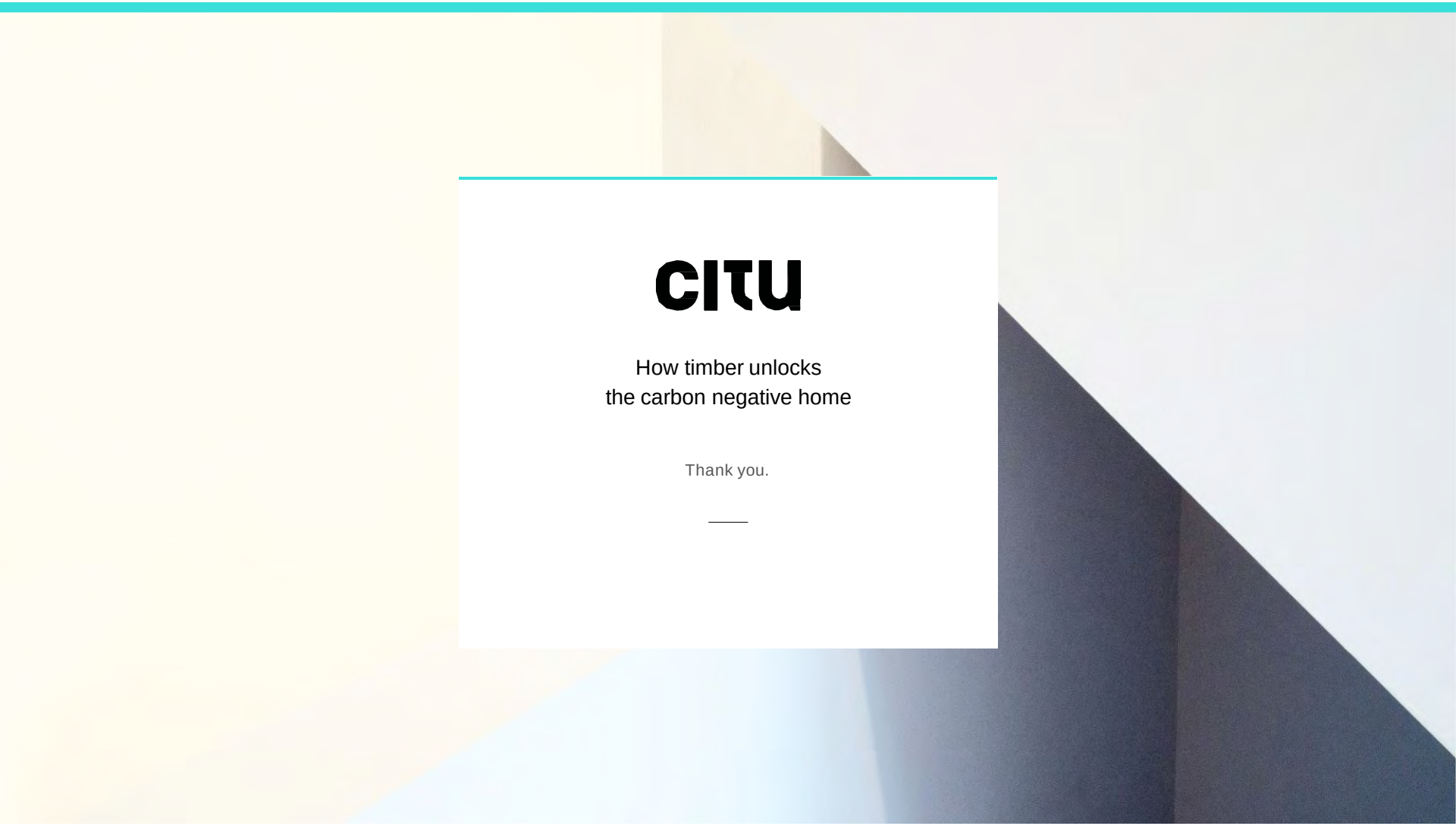
Sources: Joeri Rogelj et al

citu

Creating the carbon negative home

- Build with biomass
- Put a price on carbon
- Create a thermos not a hot plate
- Heat with renewables
- Decommission with BECCS

citu



CITU

How timber unlocks
the carbon negative home

Thank you.

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Superwood

How forestry and timber can drive a low-carbon economy

Panel discussion - your questions

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How forestry and timber can drive a low-carbon economy

Coffee break - back at 3.10pm

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How forestry and timber can drive a low-carbon economy

Session 4
Joining the dots – round-table discussion

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1) What two positives do you take away today?
2) What is biggest barrier to low-carbon economy in North-East – & how do we overcome it?

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Confor
Promoting forestry and wood

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How forestry and timber can drive a low-carbon economy

Feedback from round tables: email feedback to

stefanie.kaiser@confor.org.uk

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Thanks for coming and a very Merry Christmas

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