

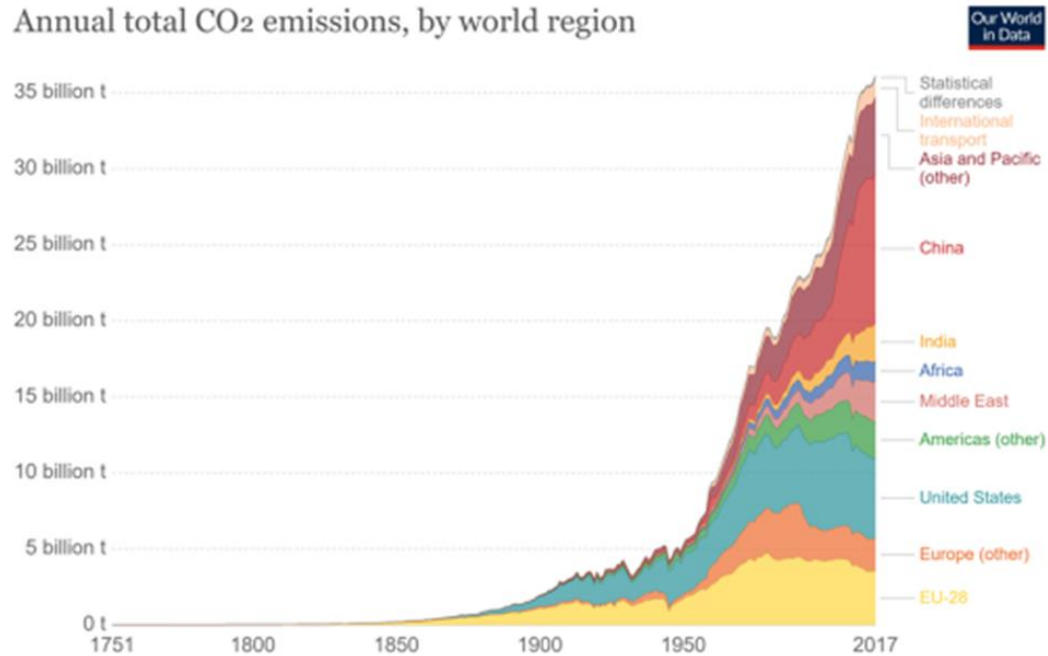
# **Delivering Net Zero Project – changing the construction of social housing in Wales through collaboration**

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Steve Cranston

Presentation to CHC Future Homes Strategic Delivery Group  
13th October 2021

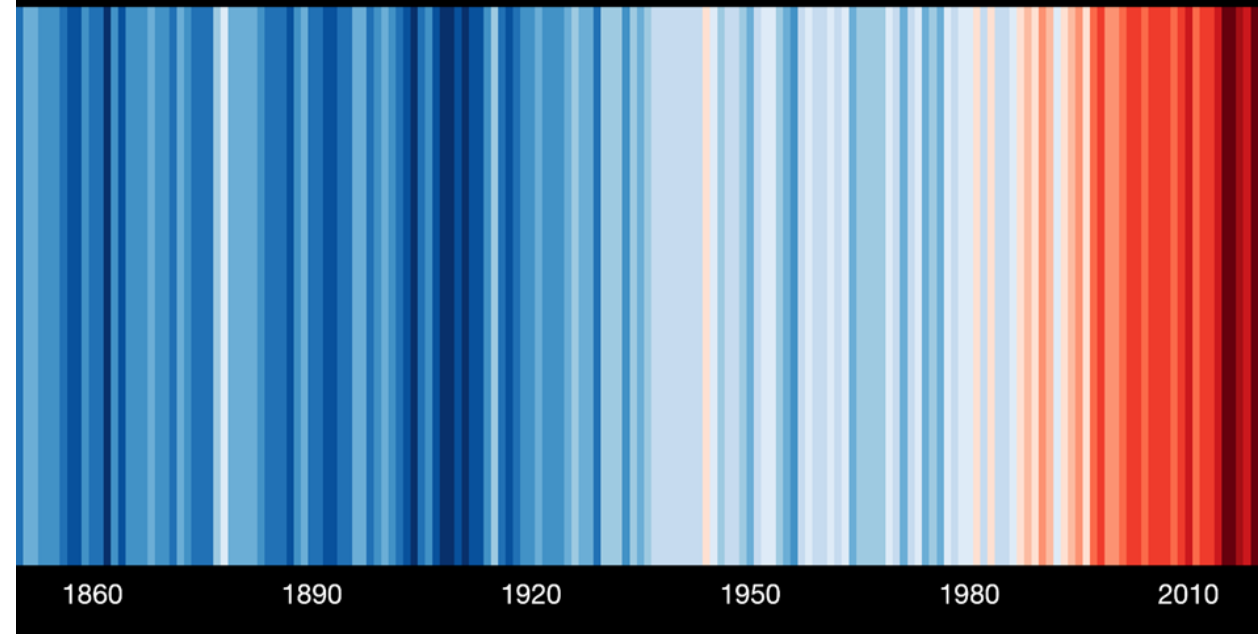
## Context - we know we need to change the way we build homes

Annual total CO<sub>2</sub> emissions, by world region



Source: Carbon Dioxide Information Analysis Center (CDIAC); Global Carbon Project (GCP)  
Note: The difference between the global estimate and the sum of national totals is labeled "Statistical differences".  
OurWorldInData.org/co2-and-other-greenhouse-gas-emissions • CC BY

Global temperature change (1850-2019)



## Context - we know we need to change the way we build homes

1kg TIMBER  
holds 1.8 kg CO<sub>2</sub>

Embodied CO<sub>2</sub>

Timber 126 tCO<sub>2</sub>e

Concrete 310 tCO<sub>2</sub>e 2.46x

Steel 498 tCO<sub>2</sub>e 3.95x

Moncaster, A.M., et al. (2018). Why method matters: temporal, spatial and physical variations in LCA and their impact on choice of structural system. *Ener. Build.* 173, 389–398.

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Embodied CO<sub>2</sub>

Timber 126 tCO<sub>2</sub>e

Stored CO<sub>2</sub>

300 m<sup>3</sup> 540 tCO<sub>2</sub>e

Moncaster, A.M., et al. (2018). Why method matters: temporal, spatial and physical variations in LCA and their impact on choice of structural system. *Ener. Build.* 173, 389–398.

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	Glulam	Concrete	Steel
Flexural strength (MPa)	30,6	30	350
Density (kg/m <sup>3</sup> )	560	2400	7850
Strength/weight (N-m/kg)	0,055	0,013	0,045

## Context - we know we need to change the way we build homes

- Innovative Housing Programme (IHP)
- The adoption of new standards for social housing construction (summer 21)
- Likely future changes to WG capital funding terms and conditions
  - Encourage and then require LCA's
  - Limit upfront carbon in construction
  - Encourage and then require post completion performance evaluation studies

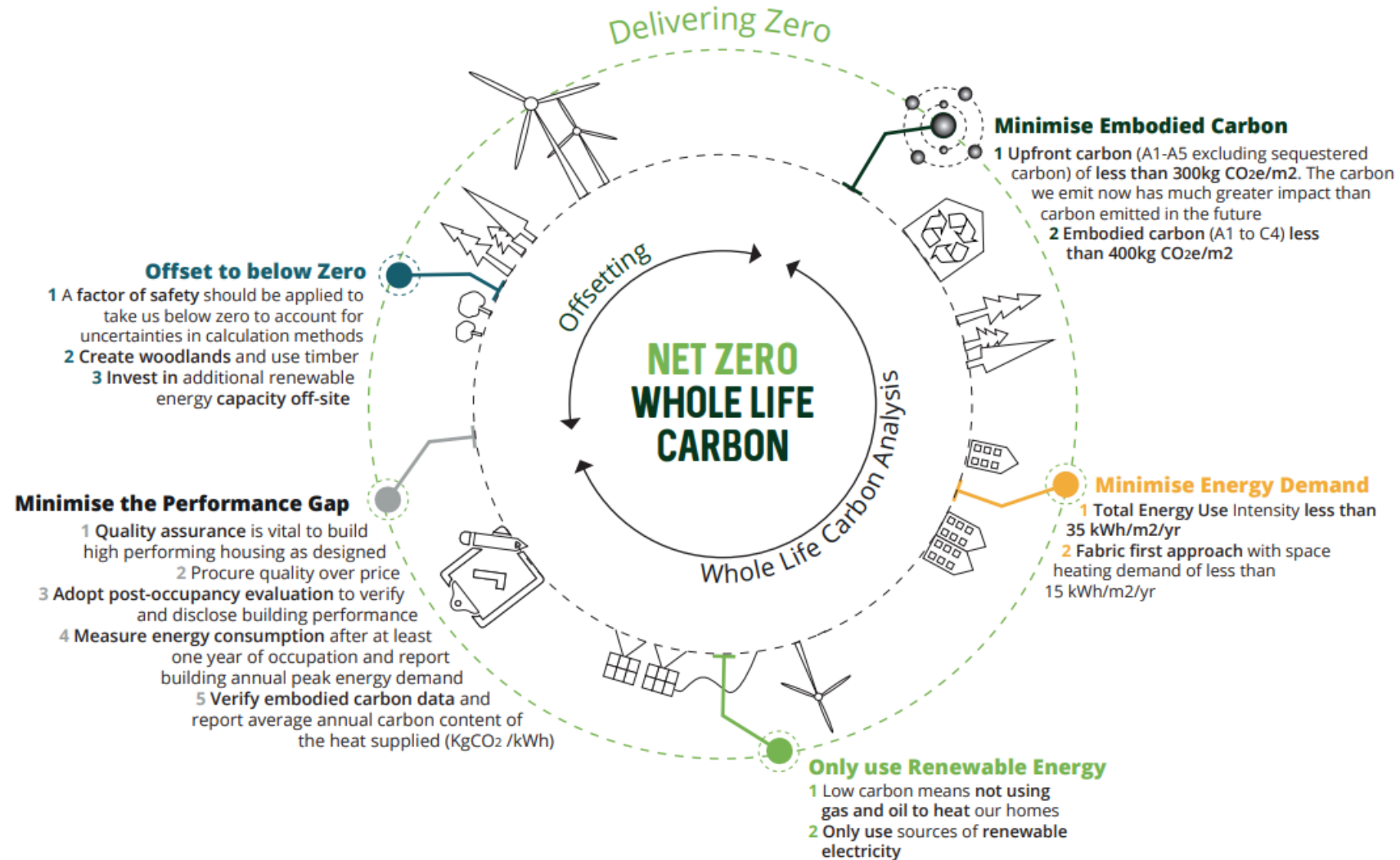
## The delivering net zero project - background

- Idea builds on:
  - the Home Grown Homes project
  - willingness of 11 stock retained councils to work in collaboration along with a small number of housing associations
  - Welsh Government willingness to support innovation
- Project is a four stage process

## Stage 1 – Home Grown Homes project

- Funded by Rural Development Programme (EU & Welsh Government)
- 30 month research project into interventions in the timber supply chain
- Work Package 6 – design of a 2 bed 4 person net zero carbon home to RIBA stage 3
- Completed December 2020
- <https://woodknowledge.wales/wp-content/uploads/2021/02/WP6-Zero-Carbon-Homes-web.pdf>

# Design Principles



## Stage 2 – Delivering Net Zero

- Powys Council awarded CRISP Innovation Funding
- Design of a short terrace of 2 bed 4 person houses to RIBA stage 4
- Identified fabric solution (advanced panel system)
- Wood fibre or cellulose insulation
- Detailing to eliminate cold bridging
- Project completed at end of March 2021



## Stage 3

- Design of additional property types
  - 1b 2p flats, 2b 3p flats, 2b 4p house, 3b 5p house
- Proto-typing and testing the build system
  - fire, structural stability and buildability
- Achieving warranties for the build system
- Whole life carbon modelling
- Development of a manual for the manufacture and assembly of homes
- Achieving QA accreditation for the manual
- Most effective way forward is to seek partners to form a collaborative partnership to deliver the project (both designers and manufacturers) via an Innovation Partnership

### Stage 3 (continued)

- Advertise opportunity on Sell2Wales (October 2021)
- Appoint supply partner(s) (Spring 2022)
- Appoint Project Managers (late summer 2021)
  - Steve Cranston (UWHA) and Catrin Sneade (Powys)
  - Drive project forward
  - Liaison with the appointed supplier
  - Identify volume of homes to be supplied via supply contract
  - Work with council DSO's and/or partner SME's to ensure skills in place to erect and fit out homes
- At conclusion of Design Contract let contract to supply homes (Autumn 2023) (Stage 4 of project)

## Can any housing association join the consortium

- Open to all
  - Sign up to MOU
  - Contribution £28.5k
  - Membership of Steering Group, Procurement Sub Group and Design Group (opportunity to help shape the direction of the project)
  - Opportunity to learn about low embodied carbon construction

## Collaboration and Co Design

- Learning from housing association experience – esp IHP
- Prototyping, learning, sharing and continual improvement
- Nurturing an active learning community
- Social housing at the cutting edge of zero carbon transition and green recovery - making the connections

# Making the Connections

- Collaboration key
- Capturing learning from MMC innovation
- Prototyping potential
- Timber Industrial Strategy
- Supporting Welsh SMEs
- Skills and Training
- Resident engagement



## We will:

- Build 20,000 new low carbon social homes for rent.
- Fundamentally reform homelessness services to focus on prevention and rapid rehousing.
- Support cooperative housing, community-led initiatives, and community land trusts.
- Create a timber based industrial strategy that can develop and sustain the high value production and processing of Welsh wood.
- Decarbonise more homes through retrofit, delivering quality jobs, training and innovation using local supply chains.
- Improve building safety so that people feel safe and secure in their homes.
- Explore where services and contracts can sustainably and affordably be brought back into a strengthened public sector.

# Learning Community

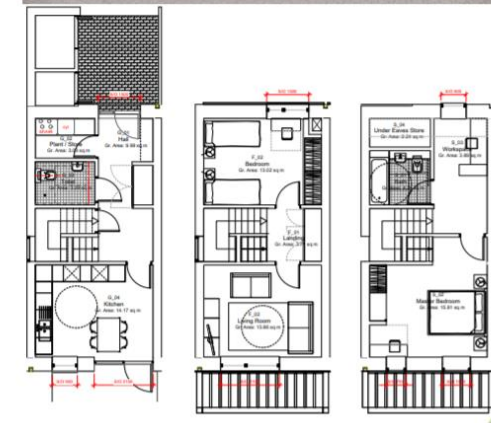
Its all to play for ...



Local authorities and housing associations are critical anchor institutions

What learning space do we need to create?

- Learning Hub?
- Communities of practice?



## Resources

- Wood Knowledge Wales - Zero Carbon Homes – Zero Carbon Timber Solutions for Wales  
<https://woodknowledge.wales/news/zch-report>
- Deputy Climate Change Minister Timber Deep Dive - Recommendations  
<https://drive.google.com/file/d/18w9VVrC0BEUBkkG3X3Kya6r7gufWlkBz/view?usp=sharing>
- U Lab – Leading from the Emerging Futures - [u.lab: Leading From the Emerging Future | edX](https://www.edx.org/course/u-lab-leading-from-the-emerging-futures)
- Circular Economy Innovation Communities - CEIC [https://www.swansea.ac.uk/som/business/ceic-programme/#:~:text=Circular%20Economy%20Innovation%20Communities%20\(CEIC\)%20is%20a%20fully%20funded%20project,environment%20to%20collaboratively%20identify%20and](https://www.swansea.ac.uk/som/business/ceic-programme/#:~:text=Circular%20Economy%20Innovation%20Communities%20(CEIC)%20is%20a%20fully%20funded%20project,environment%20to%20collaboratively%20identify%20and)
- Welsh Government - Modern Methods of Construction Strategy for Social Housing -  
[https://gov.wales/sites/default/files/publications/2020-02/social-house-building-strategy\\_0.pdf](https://gov.wales/sites/default/files/publications/2020-02/social-house-building-strategy_0.pdf)

## Want to Know More .....

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- [Steve.Cranston@unitedwelsh.com](mailto:Steve.Cranston@unitedwelsh.com) 07771942289
- Drop in sessions October 20<sup>th</sup> Oct am & 2<sup>nd</sup> November am
- Follow on workshop 24<sup>th</sup> November 2 – 3.30pm