Question:

What are the problems with the housing system?

WESSEX COMMUNITY ASSETS

Tim Crabtree

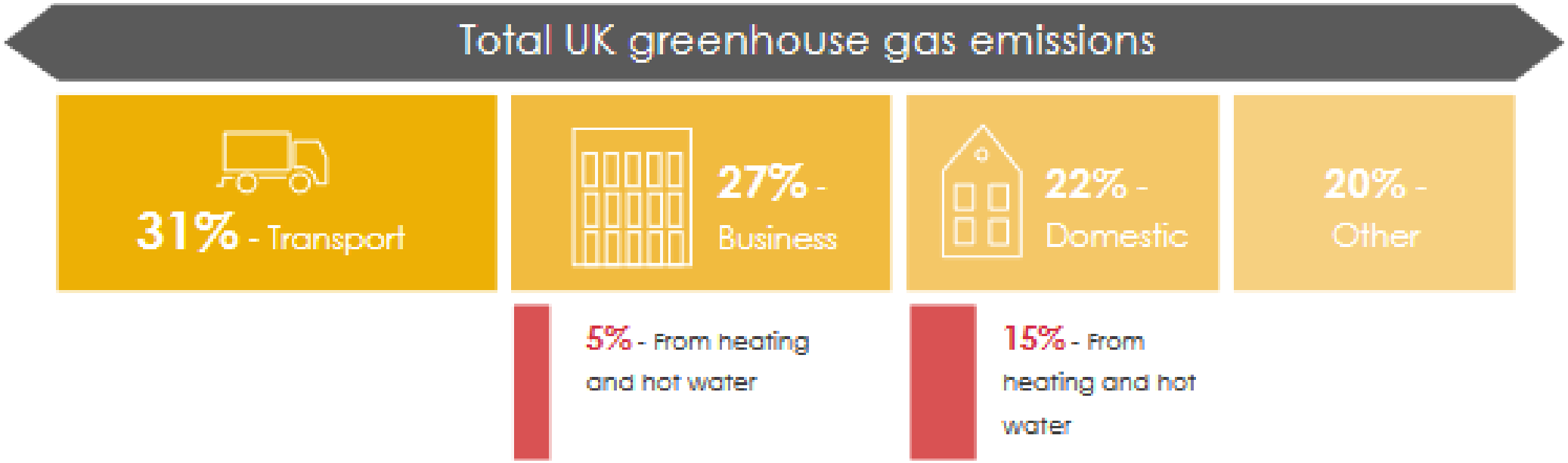
Wessex Community Assets

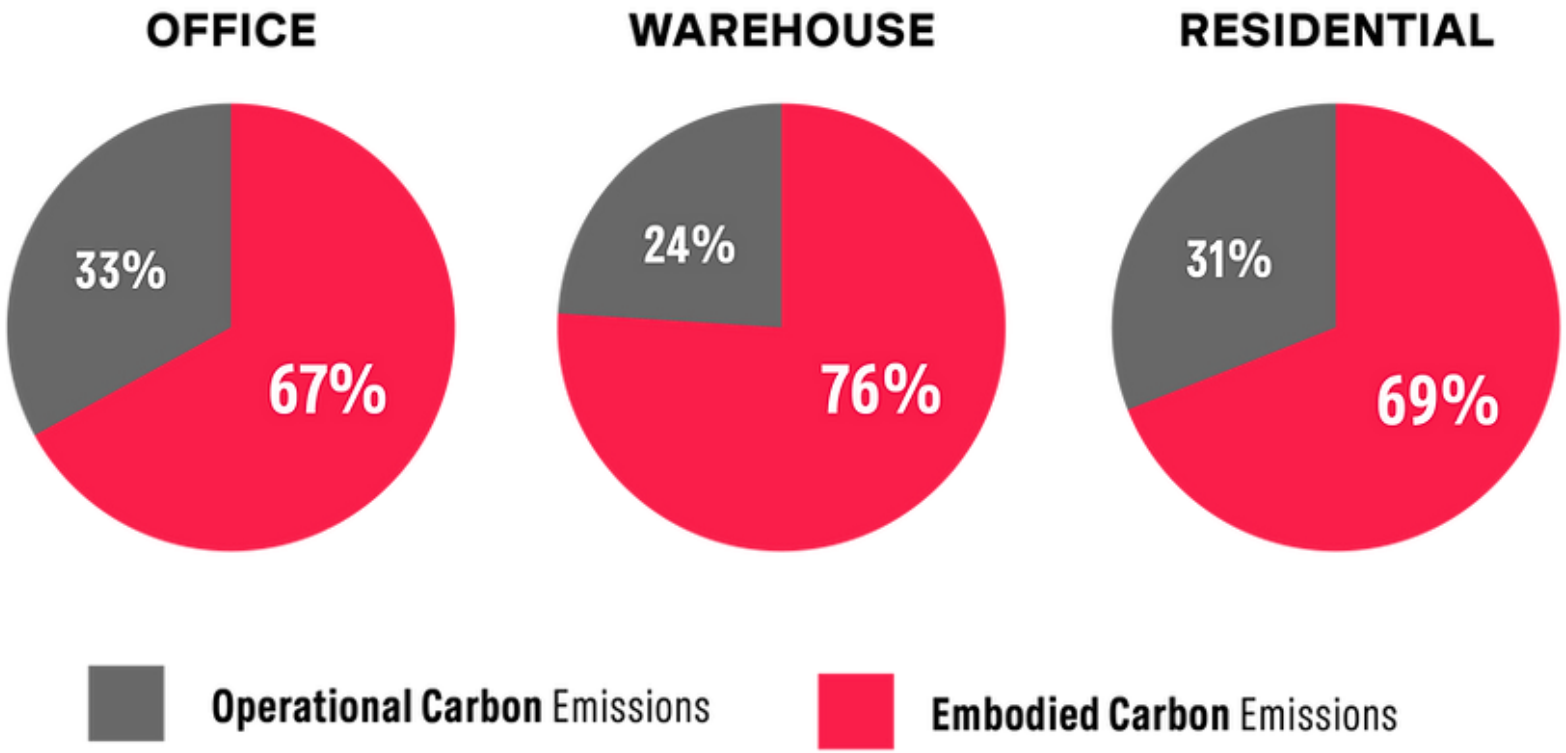
The challenge:

We need the majority of new houses to be affordable and sustainable....

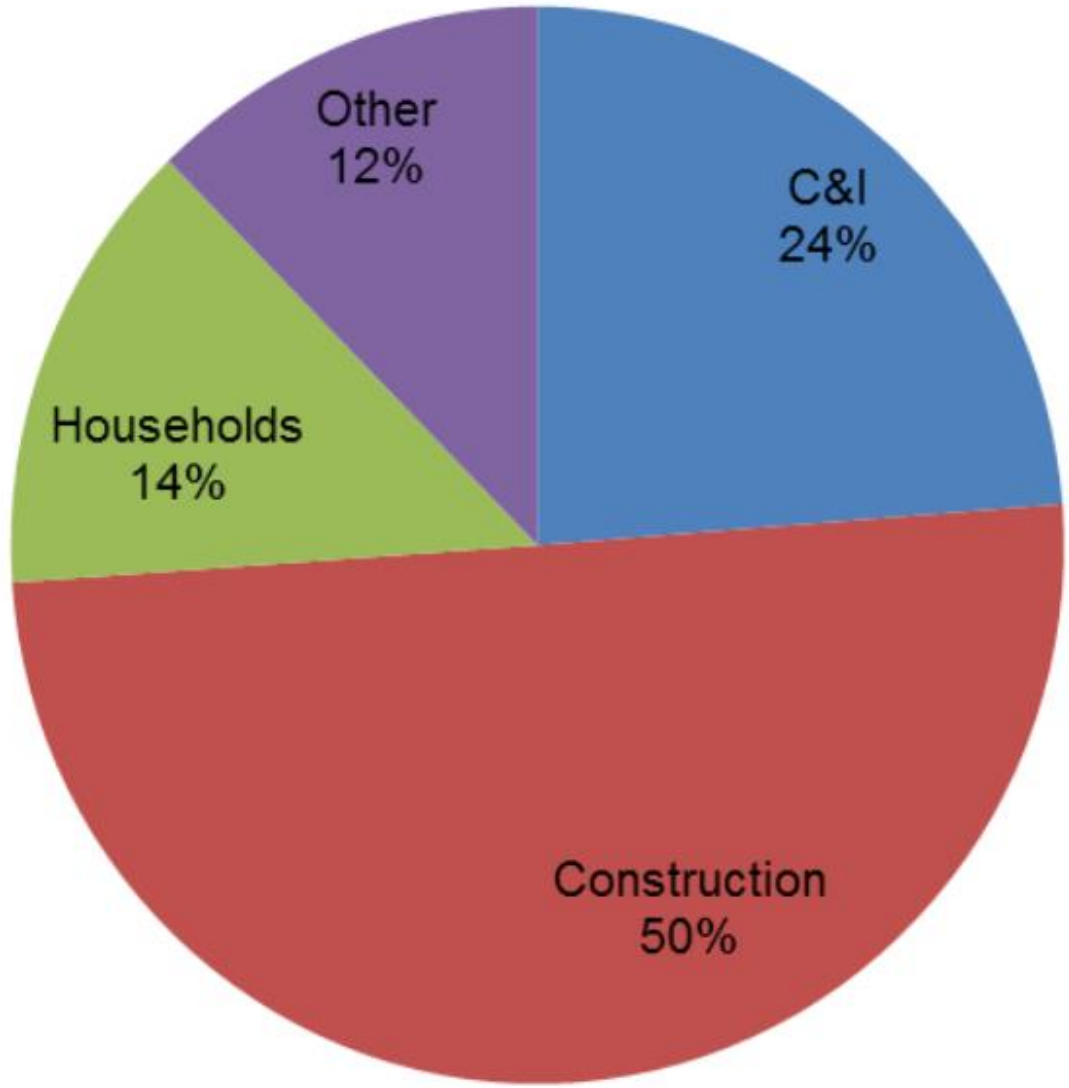
And we need to transform the existing housing stock.

Total UK greenhouse gas emissions





Diagrams: Sturgis Carbon Profiling/ RICS.



Source: Waste Statistics Regulation return

Wessex Community Assets: 20 years of innovation

- Created a £13 million home improvement lending service with 15 local authorities.
- Pioneered the use of community shares as a financial mechanism.
- Key organisation in the development of community land trusts in the UK.
- Developed one of the UK's largest enabling services for community-led housing. 30 community land trust projects completed – over 300 houses; 30 projects in progress.
- WCA has supported over 100 community enterprises in fields such as local food, renewable energy, employment workspace and affordable housing.

£22,427,724
Total amount lent

£8,835,347
Total loan book

3,526
Released loans

Wessex
Home Improvement Loans
Lending Our Support

lendology·cic

Bath & North East Somerset Council
Improving People's Lives

Bristol City Council

Dorset Council

East Devon

Exeter City Council

Mid Devon District Council

northdevon

North Somerset Council

Somerset Council

South Gloucestershire Council
Delivering for you

South Hams District Council

Teignbridge .gov.uk

Torridge District Council

West Devon Borough Council

Wiltshire Council

wessexca.co.uk

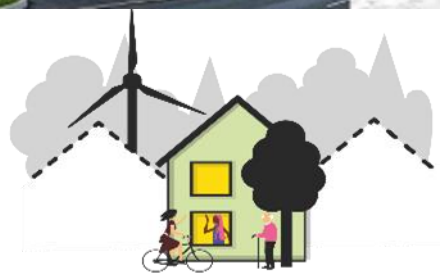
	The concerns we are addressing
Affordable sustainable housing	The housing crisis: – Lack of affordability – Disparity between house prices and average wages – Lack of security – Lack of sustainability
Local enterprise infrastructure	The crisis of livelihoods: – Fragile local economies – Job insecurity – Lack of skills & facilities to create regenerative & resilient local economies
Regenerative land management	The ecological crisis: – Climate change – Biodiversity loss – Pollution, including from intensive agriculture – Resource depletion

Wessex Community Assets: Impact across the region

- Increase in affordable housing
- Increase in community engagement & participation
- Development of community assets
- Addressing the environmental impact of construction & refurbishment
- Development of local economy infrastructure and support for SME’s, farmers & foresters
- Development of training programmes

Wessex Community Assets: 2003 – 2024

Supporting 60 CLTs across Devon, Dorset & Somerset



wessexca.co.uk

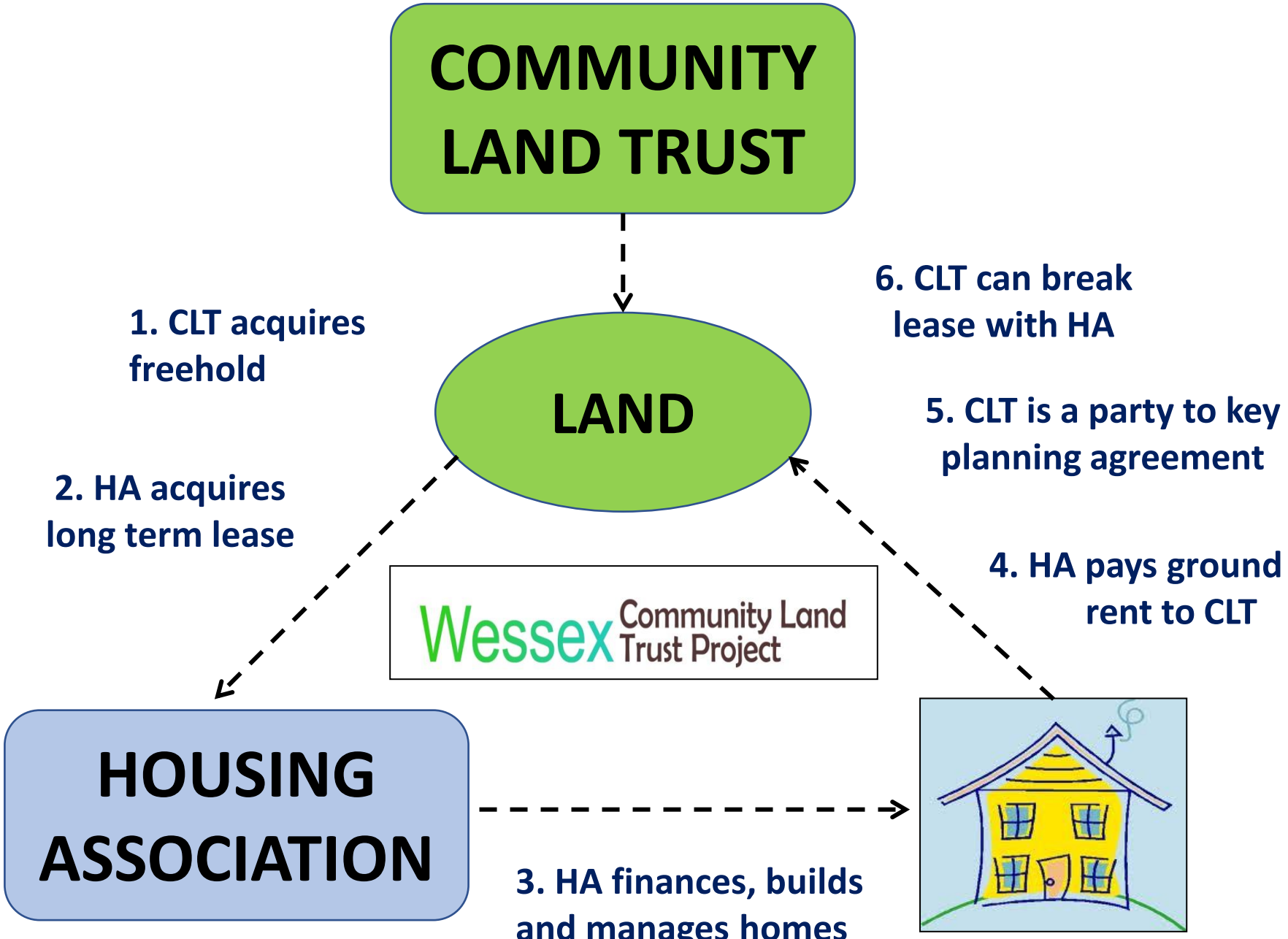
2011 – 2022

A focus on CLT partnerships with housing associations

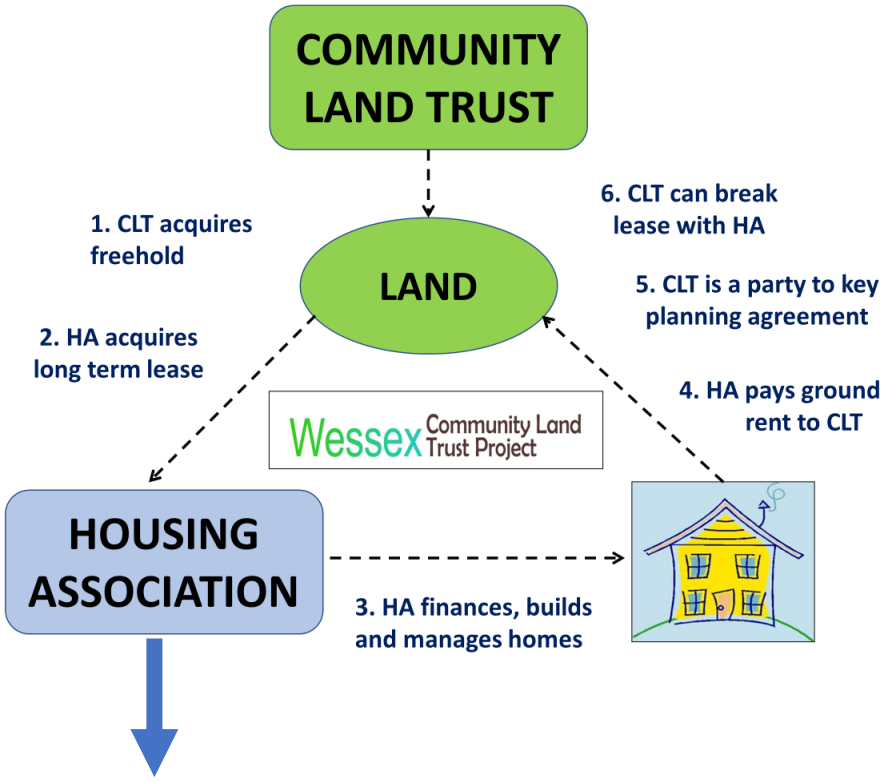
Wessex Community Assets: 2003 – 2023

Supporting 60 CLTs across Devon, Dorset & Somerset

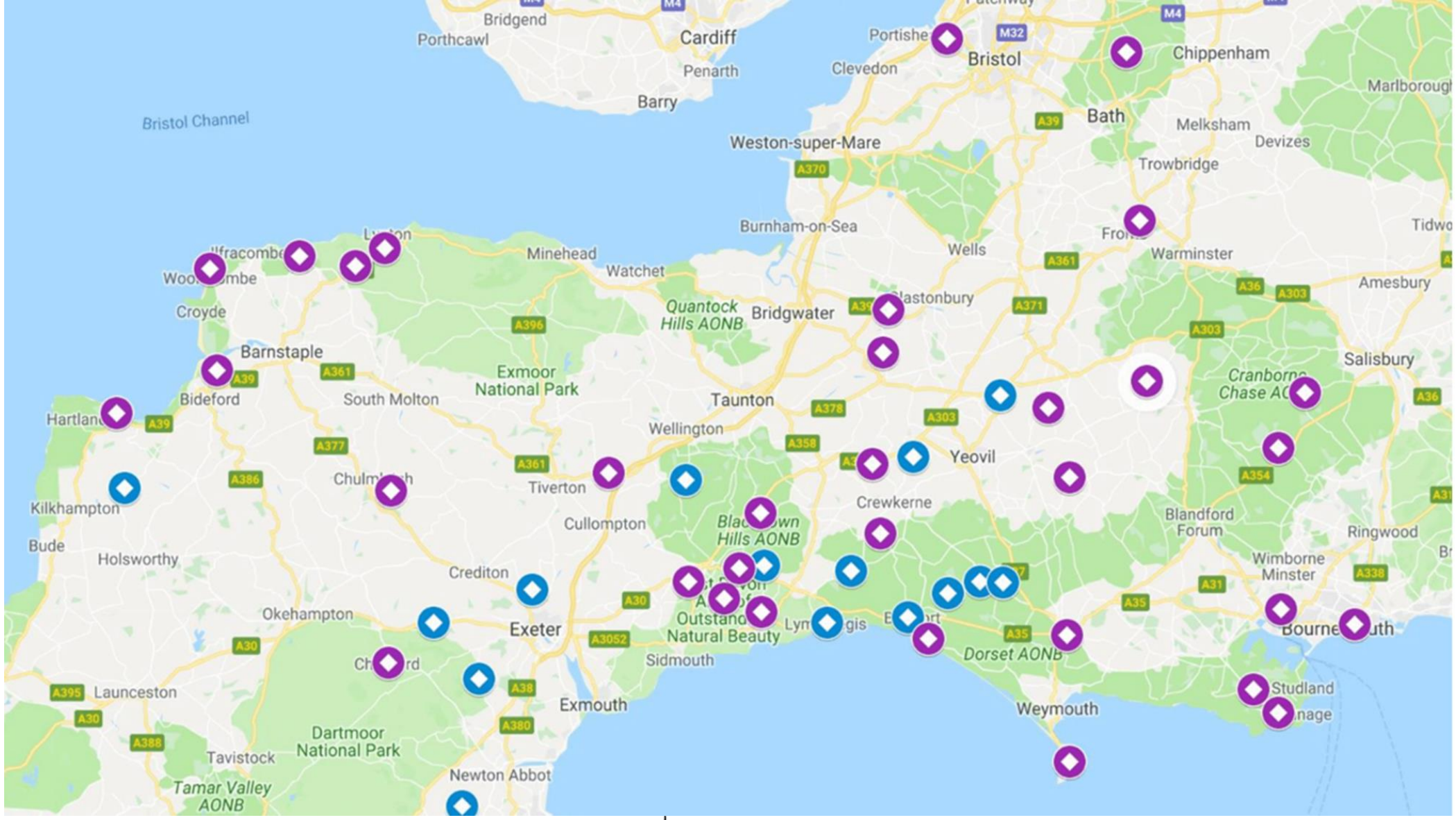
wessexca.co.uk


COMMUNITY LAND TRUST
1. CLT acquires freehold
LAND
6. CLT can break lease with HA
5. CLT is a party to key planning agreement
2. HA acquires long term lease
4. HA pays ground rent to CLT
Wessex Community Land Trust Project
HOUSING ASSOCIATION
3. HA finances, builds and manages homes

Financial model



Pays a fee to Wessex Community Assets
for every house that secures planning permission
£3000 x 300



wessexca.co.uk

Raise the Roof

FUNDED BY:

Bridport Area Community Housing

UNIVERSITY OF PLYMOUTH

THE ARTS DEVELOPMENT COMPANY

Friends Provident Foundation
Fair economy. Better world.

connected everything.

UKRI Engineering and Physical Sciences Research Council

Bridport Community Shed
A place for making, sharing, recycling and repairing

ASSEMBLE

LOCAL MATTERS

COMMON GROUND

Nationwide Foundation

Dorset Area of Outstanding Natural Beauty

Department for Environment Food & Rural Affairs

The Raise the Roof project addresses three inter-locking crises:

- The **crisis in the housing sector** across the UK, characterised by lack of affordability, lack of sustainability and lack of security.
- The **crisis of livelihoods** in the UK's towns, characterised by low average wages and job insecurity, lack of access to skills training, and lack of support and resources to support the start up or expansion of local enterprises.
- The **ecological crisis**, encompassing climate change, biodiversity loss and poor management of the natural environment, including agricultural land and woodlands, combined with pollution and resource depletion.

The Raise the Project seeks to answer these questions:

- Can we build or refurbish housing in such a way that we help maintain and create jobs within a resilient local economy?

- Can we imagine new and creative designs and construction methods for the houses we want to (re-)build – and ensure they are affordable?

- Can we draw on sustainable materials that flow out of regenerative forestry and agriculture?

Community-led housing is currently making a limited contribution to addressing these crises

Housing crisis	Crisis of participation & democracy	Ecological & climate crisis	Crisis of local economies & jobs
Limited numbers of community-led housing currently being developed	Most groups do not have sufficient capacity so housing associations take the lead	Design constraints, material constraints, financial constraints	Housing developers & contractors do little to contribute to the local economy or job creation

There is an opportunity to deliver homes affordably and sustainably by:

- Growing + processing materials locally
- Pre-fabricating structures off-site
- Assembling structures on-site
- Self-finishing by residents

Dorset Community Action

LOTTERY FUNDED

Communities Living Sustainably in Dorset

Bridport Community-led Economic Development

Local Materials in Construction

Tim Crabtree

2017

Timber & other local materials as key inputs

Affordable, sustainable houses

Potential local building materials

Raw material	Product	Possible sources
Stone	Stone facing	Existing small quarries
Boulders	Saddle stones	Local farms
Lime	Lime putty	Small scale clamp burning
Slate	External floor slabs	Several local quarries
Cobbles	External floors and paths	Local rivers, streams.
Gravel	For back-fill and bedding	Local quarries
Sand	For mortars, renders and plasters	Local quarries and rivers, seashore, streams
Subsoil for cob	Cob for mass walling	Local farms
Clay for plasters	Base coat plasters, clay slips and clay/straw infill panels	Extensive clay beds in the local area. Also available as processed dry clay in bags
Clay for pigments	Natural clay and lime based paints	Extensive in the local area
Naturally durable timber	Rafters, beams, joists and cladding and roof shingles	Oak, Sweet Chestnut, larch, Douglas Fir, Western Red Cedar
Non durable timber	Studwork and internal boarding and joinery	Spruce, Scots pine, Ash, Willow, as well as the above
External Joinery grade timber	Windows and Doors	Oak, Sweet Chestnut, European Larch
Floor boards	Heavy use	Oak, Sweet Chestnut, Ash
Straw bales	Straw bale walls and staw/clay slip infill	Local arable farmers
Agricultural hemp	Cast lime/hemp shiv infill	Local arable farmers
Sheeps wool	Loose insulation	Local Farmers
Thatching reed	Roofing	Sourced from local wetlands

Net zero and sustainable construction

https://www.materialepyramiden.dk/


· Tiny House Building Course ·
· 26-30. July and 23-27 Aug ·
for a two-week
practical course in Dorset.

Assemble’s initial propositions

Key types - Mansion Type

Key types - Courtyard Row Type

Construction -

Extensive use and expression of
natural and site-based materials

Wall buildup

Exterior cladding

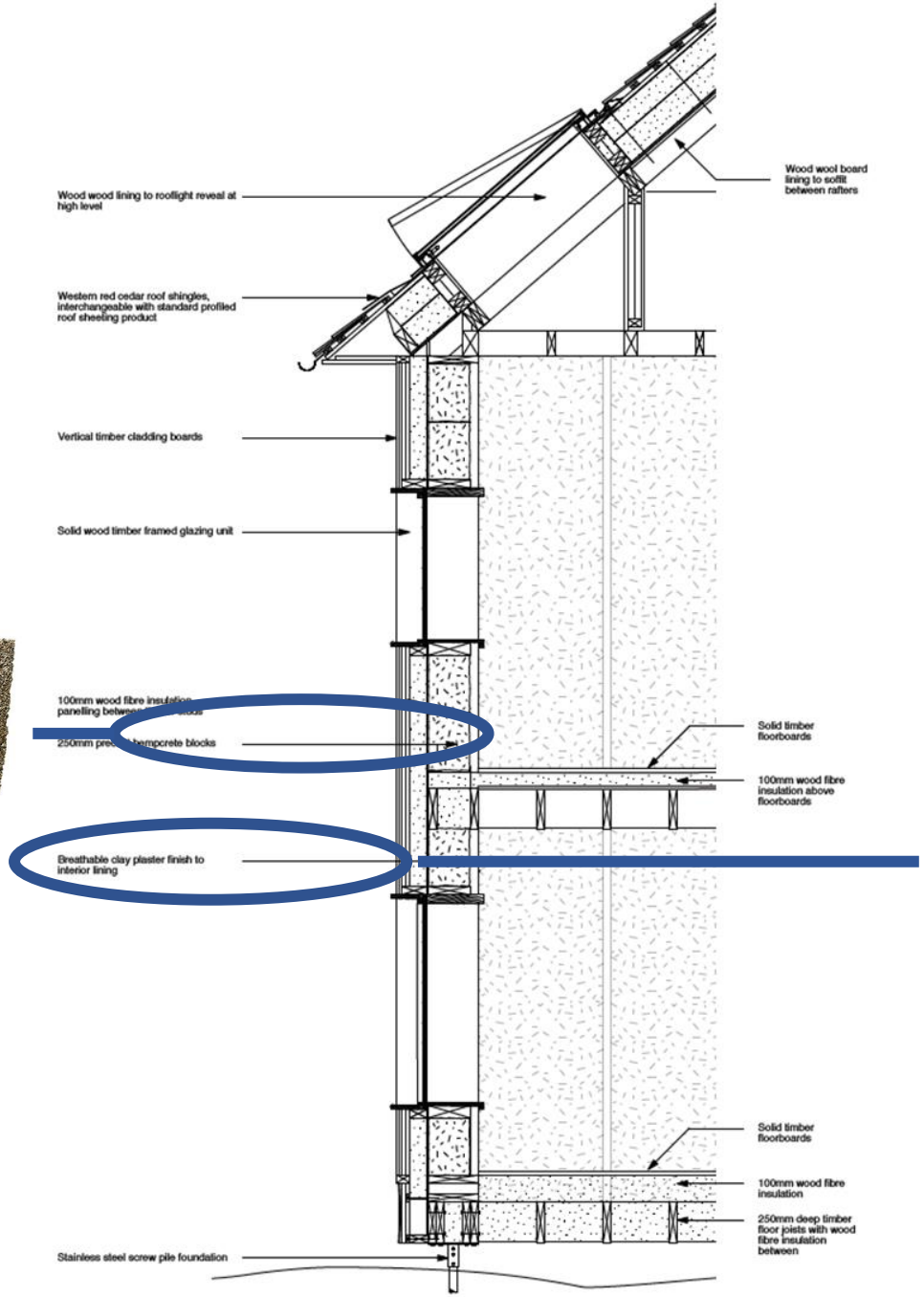
Technology -

combining building crafts
with contemporary technology

Structure

Envelope

Hempcrete insulation within timber panels

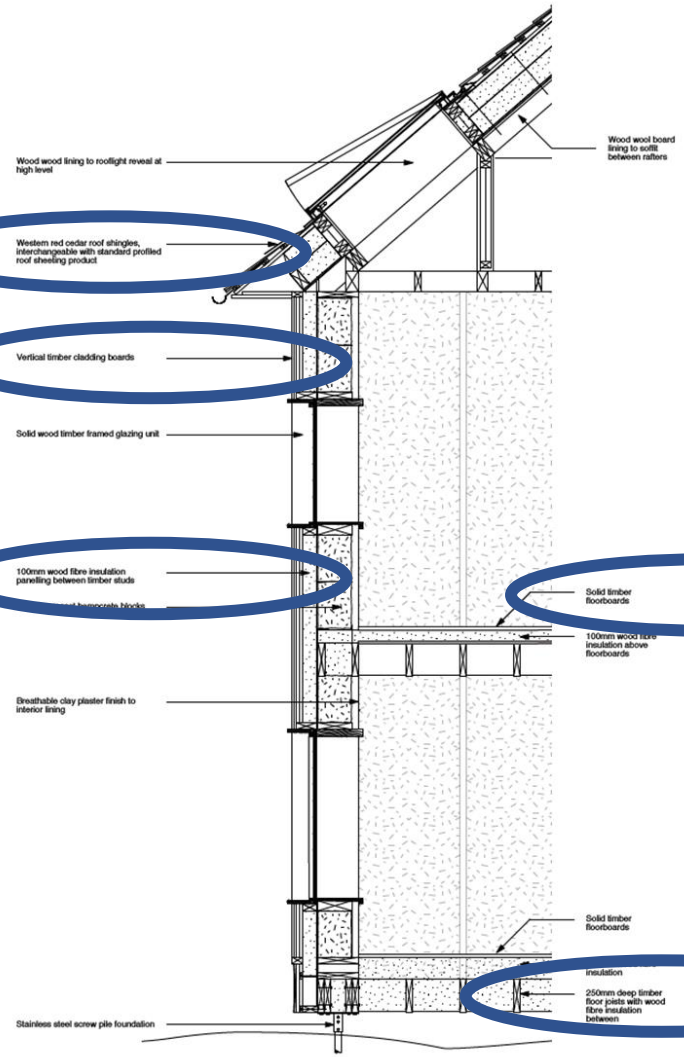


Clay plaster finish

Timber shingles

Timber cladding

Timber stud work

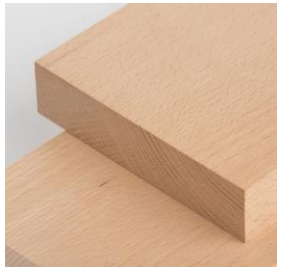


Timber floorboards

Timber floor joists

Western red cedar

Oak



Beech

Ash

Sweet chestnut

Larch

Connected Everything (EPSRC programme): Development of models & prototypes with Plymouth University's Digital Fabrication Lab

UNIVERSITY OF PLYMOUTH

Alejandro Veliz Reyes (Digital Design & Fabrication)
Pieter De Wilde (Building Performance Analysis)

Computing Craft 2018-20

SWCTN Automation Fellowship 2019-20

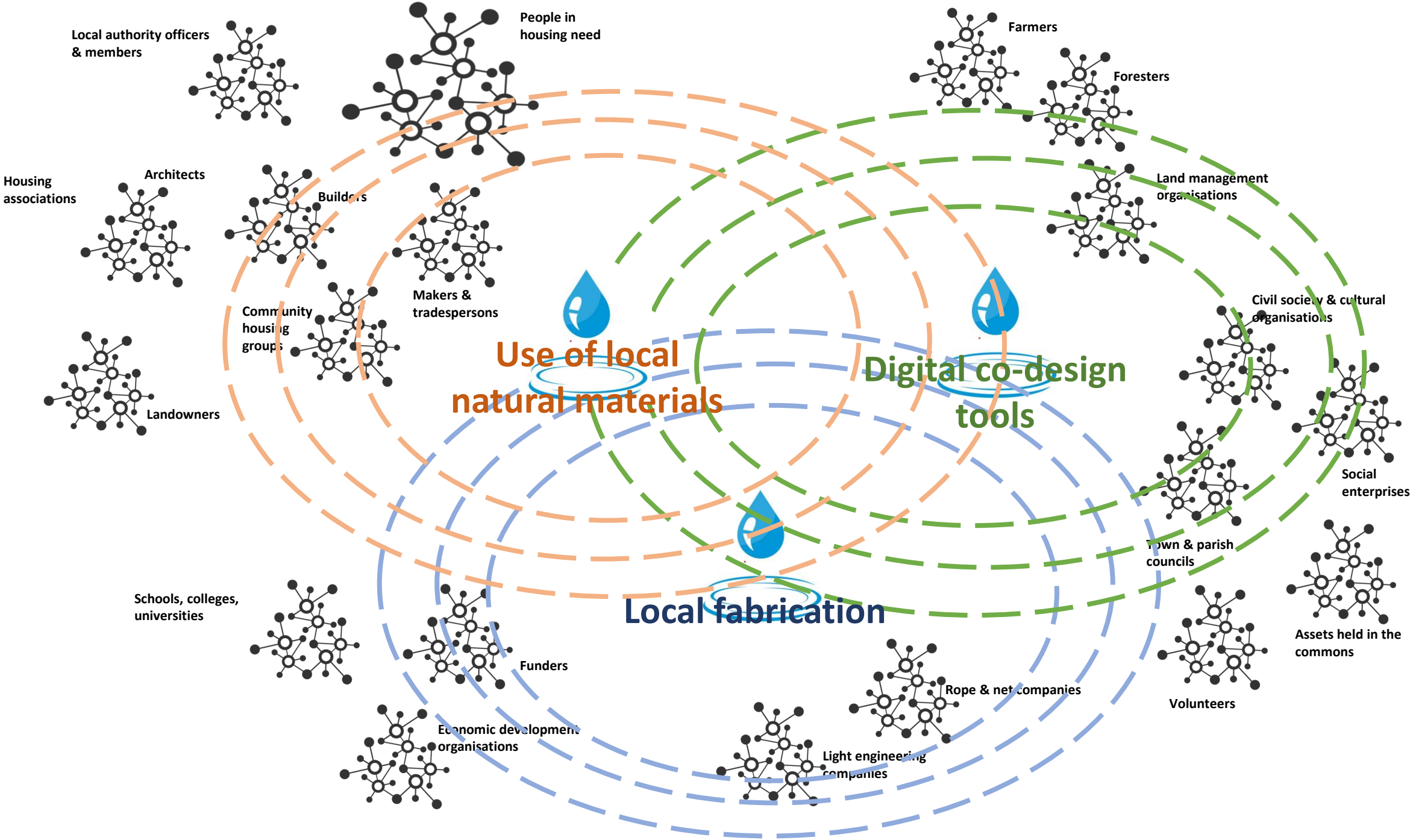
UBB Chile, 2019

ADVISORY PANEL

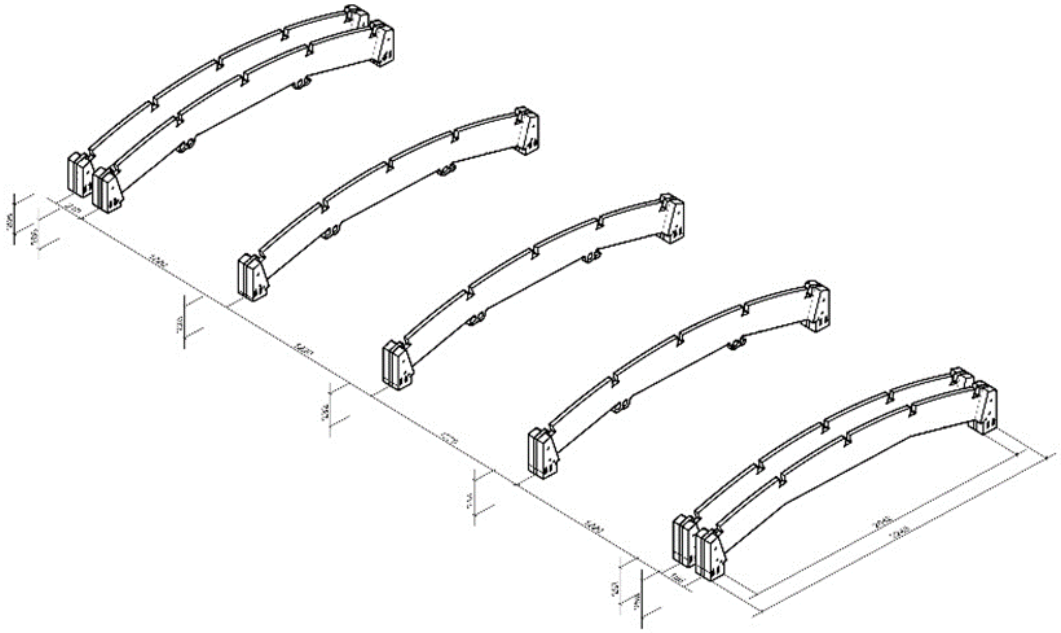
Tim Crabtree, Wessex Community Assets
Mollie Claypool, Automated Architecture Ltd

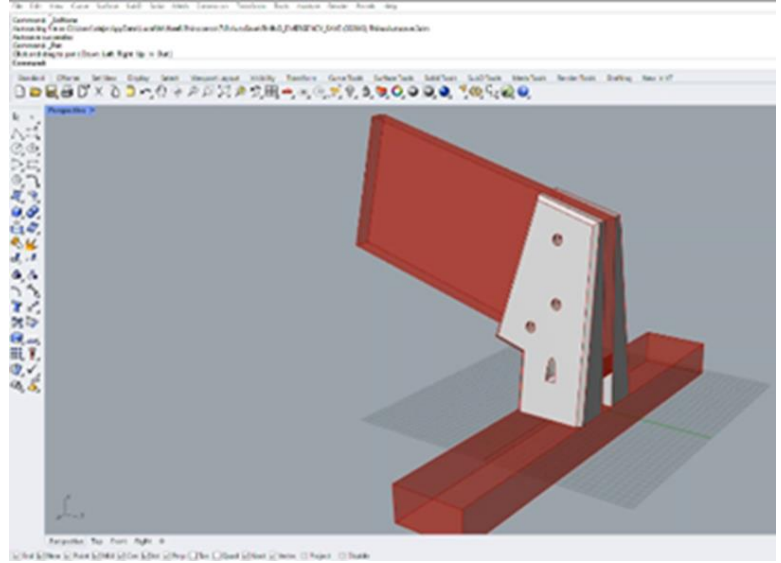
AUAR 2020

AUAR 2020

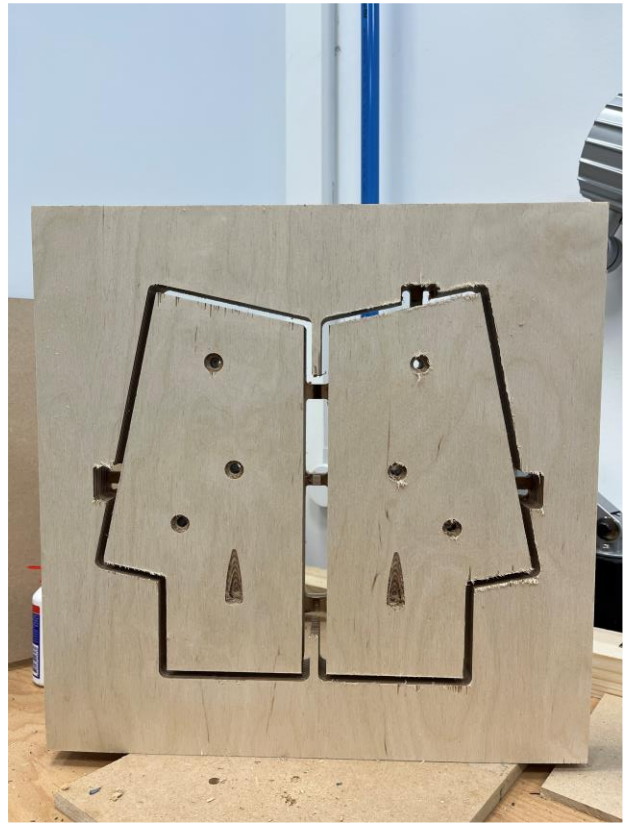

Local authority officers & members
People in housing need
Farmers
Foresters
Housing associations
Architects
Builders
Land management organisations
Community housing groups
Makers & tradespersons
Civil society & cultural organisations
Use of local natural materials
Digital co-design tools
Landowners
Social enterprises
Town & parish councils
Local fabrication
Schools, colleges, universities
Assets held in the commons
Funders
Rope & net companies
Volunteers
Economic development organisations
Light engineering companies

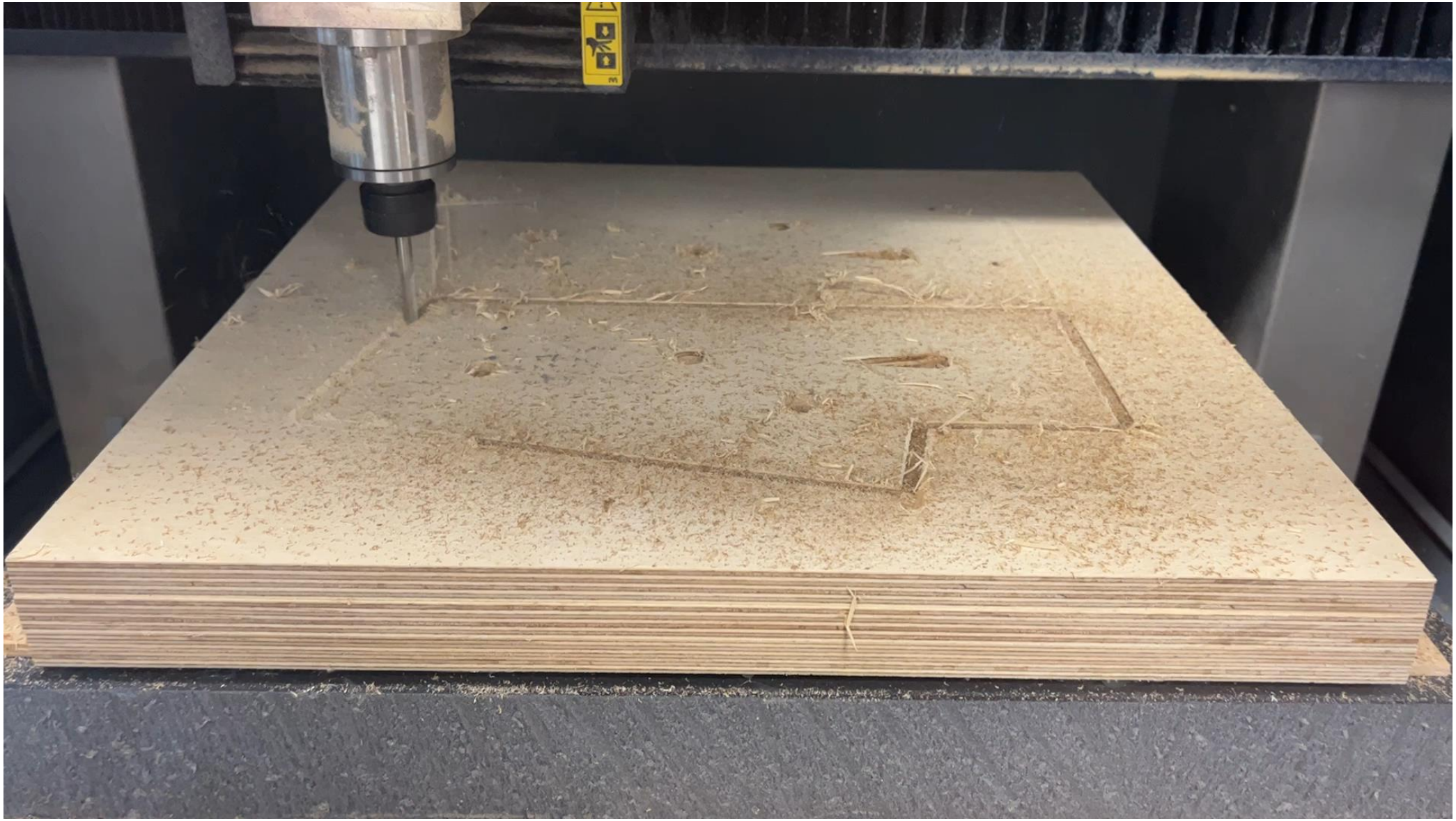
Prototyping 1



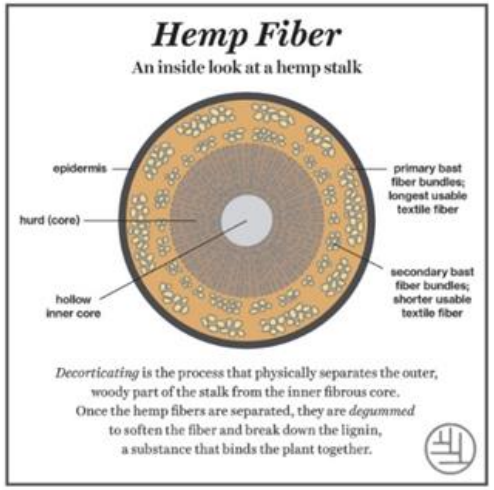


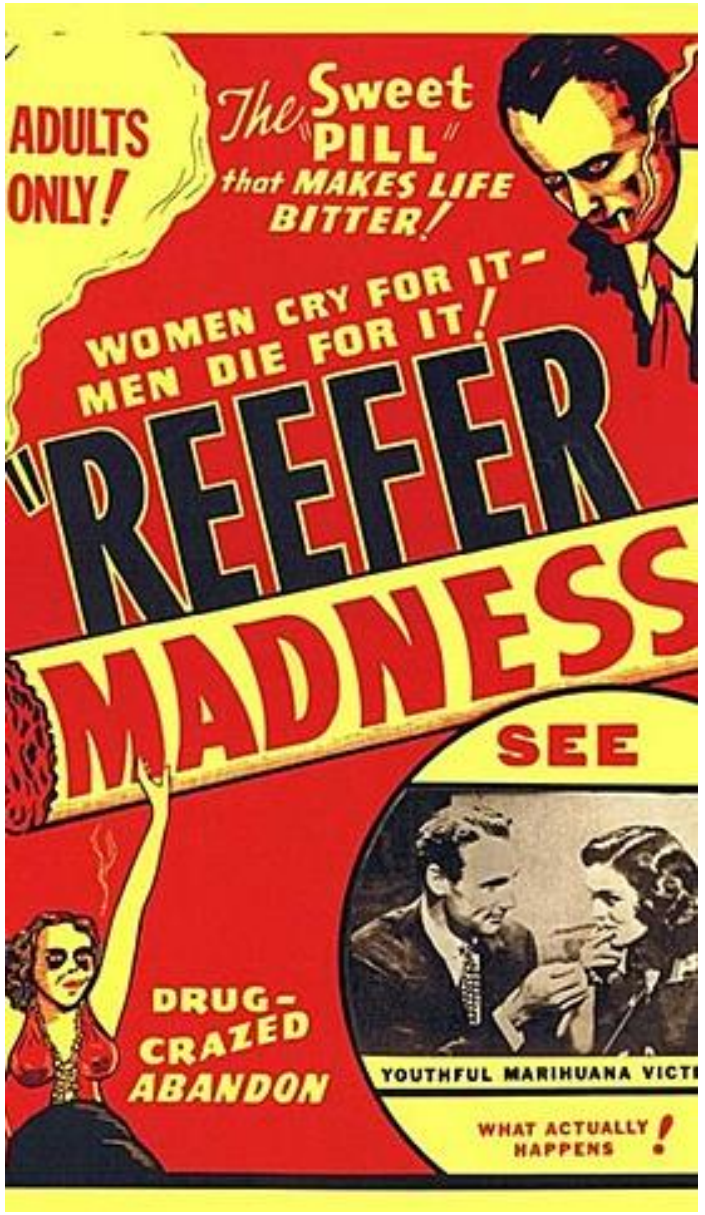

Roland
MDX-540



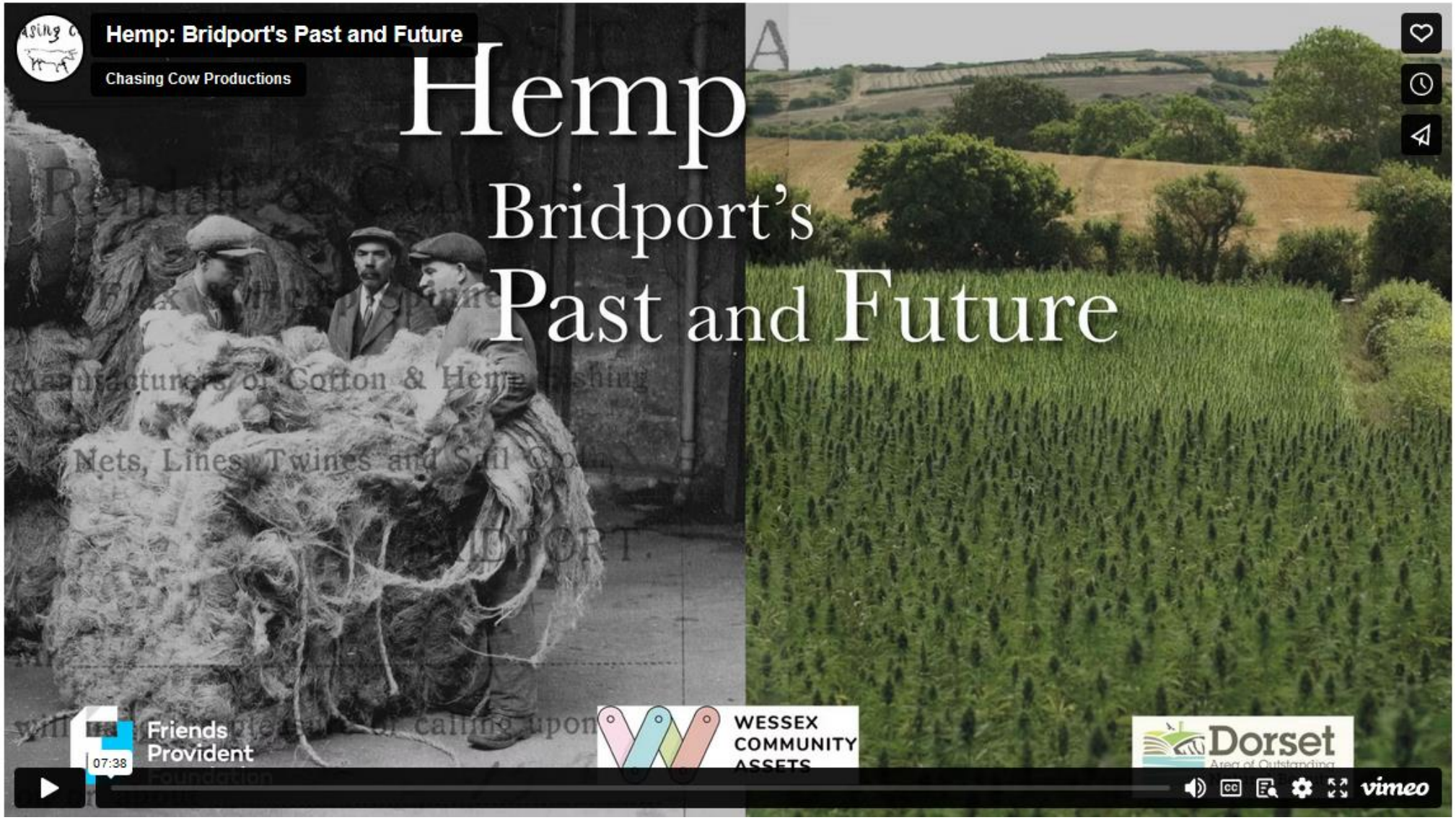


West Dorset's heritage of flax and hemp




ADULTS ONLY!
The Sweet "PILL" that MAKES LIFE BITTER!
WOMEN CRY FOR IT-
MEN DIE FOR IT!
REEFER MADNESS
SEE
DRUG-CRAZED ABANDON
YOUTHFUL MARIHUANA VICT
WHAT ACTUALLY HAPPENS!


Dorset
Area of Outstanding
Natural Beauty
Dorset
Area of Outstanding
Natural Beauty



https://www.chasingcow.co.uk/hemp-bridports-past-and-future

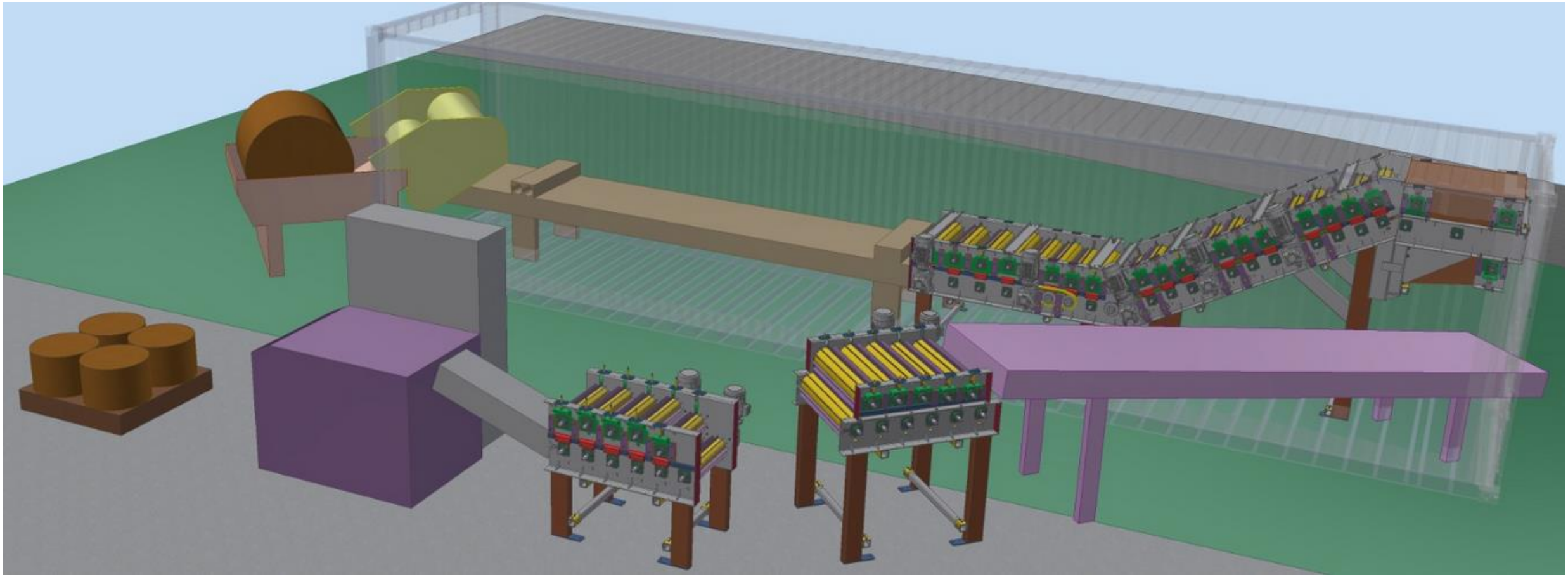
‘Raise the Roof’ WCA Hemp Field Trials Documentary

https://vimeo.com/777865350

the harvest in numbers

- 15 tonnes of ensiled hemp- forage harvested
- 10 small round bales of wrapped ensiled hemp
- 8 large round bales of retted hemp
- 4 tonnes of loose retted hemp
- 50 small rectangular bales
- 35 people who came to fibre day

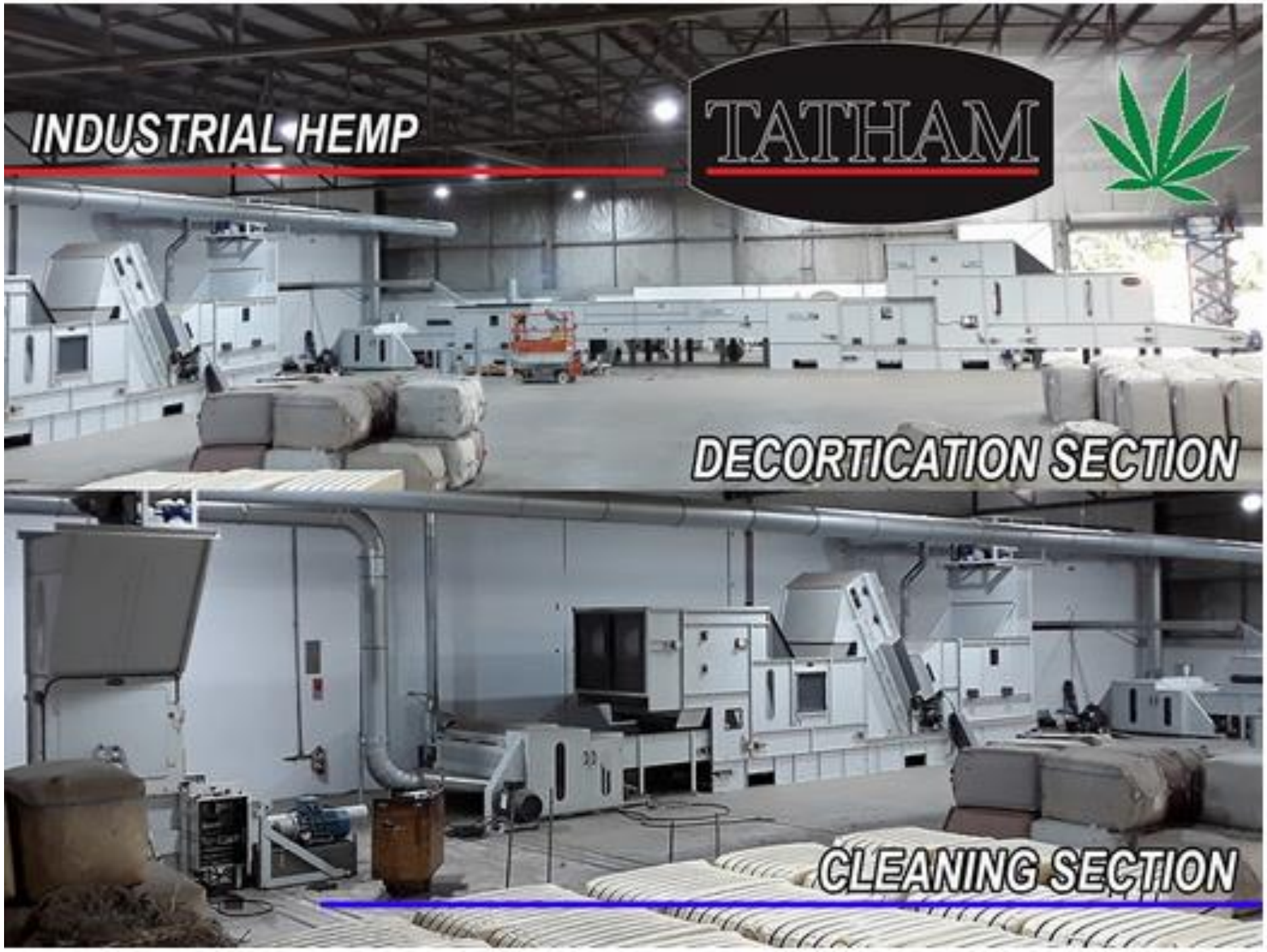

HurdMaster
MD1000
PERUZA



HEMP - ACT

FIBERTRACK 660

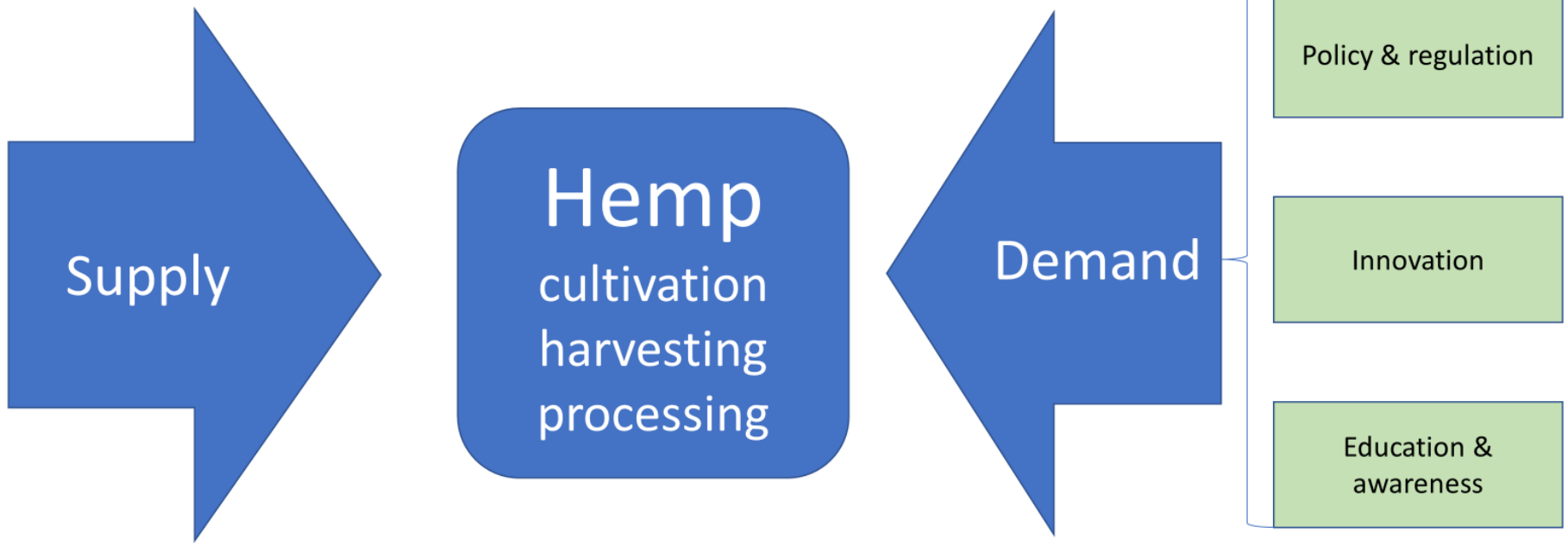
DECORTICATION ENGINEERED FOR TODAY'S HEMP INDUSTRY


INDUSTRIAL HEMP
TATHAM
DECORTICATION SECTION
CLEANING SECTION

- Quite easy to grow

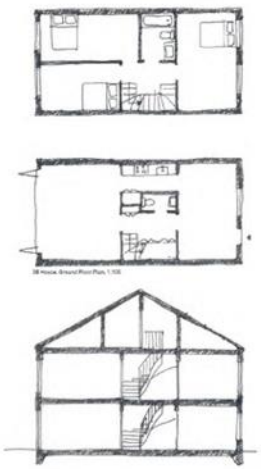
- Difficult to harvest without specialist machinery

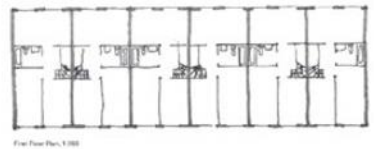
- Farmers/contractors would only invest in that machinery if there is sufficient scale of processing infrastructure

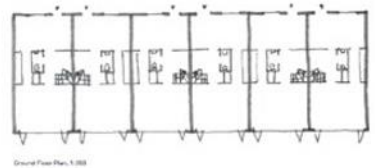


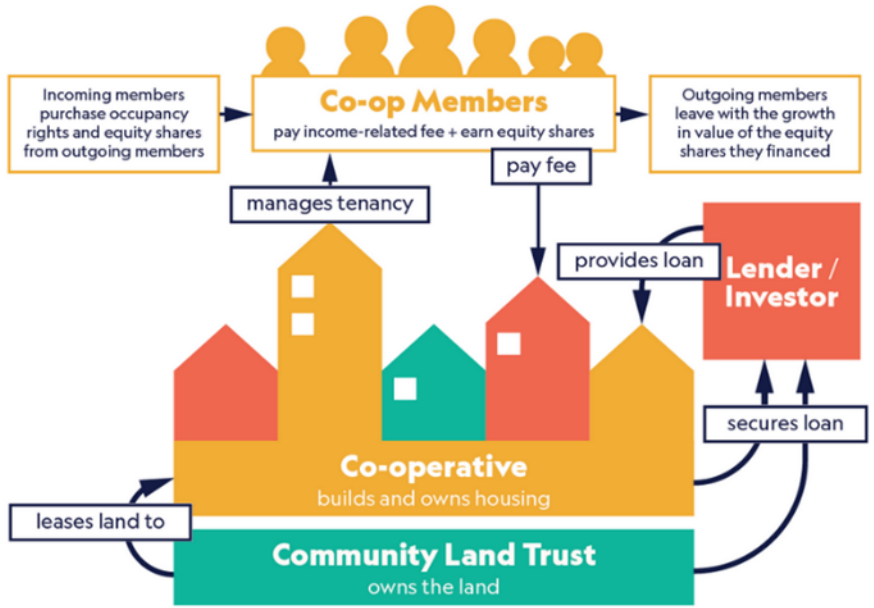
Prototyping 2

1:1 Housing system prototyping



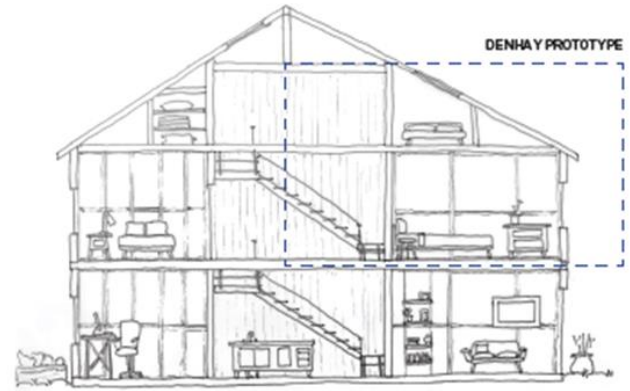


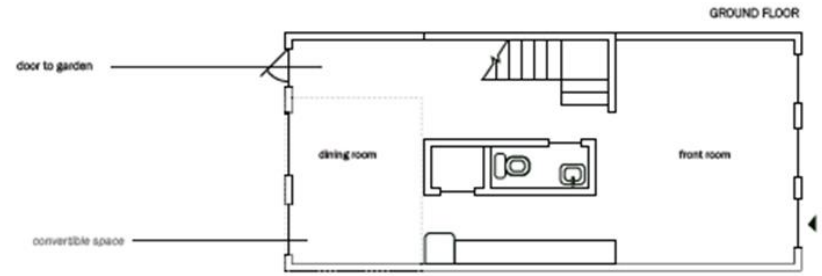


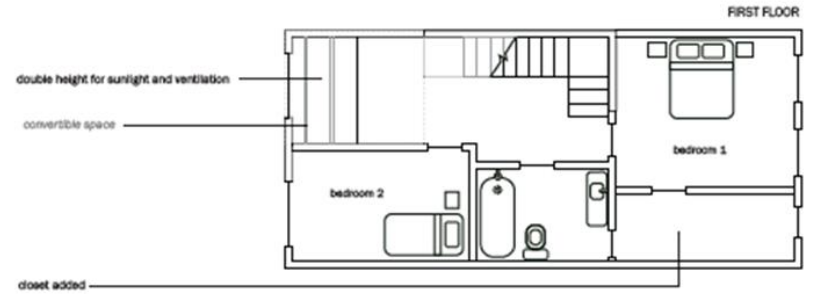


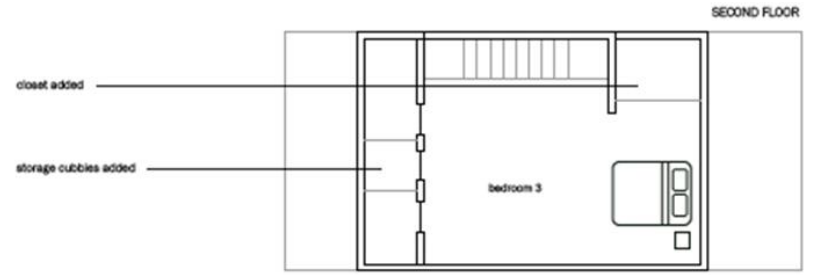
TYPE 1:
ROW HOUSE - BASIC

This layout provides the fastest route to a finished, mortgageable shell. Minimum partitions need to be added initially aside from toilets and optionally bedrooms. This offers the greatest flexibility for the home owners to decide spatial configuration throughout time.









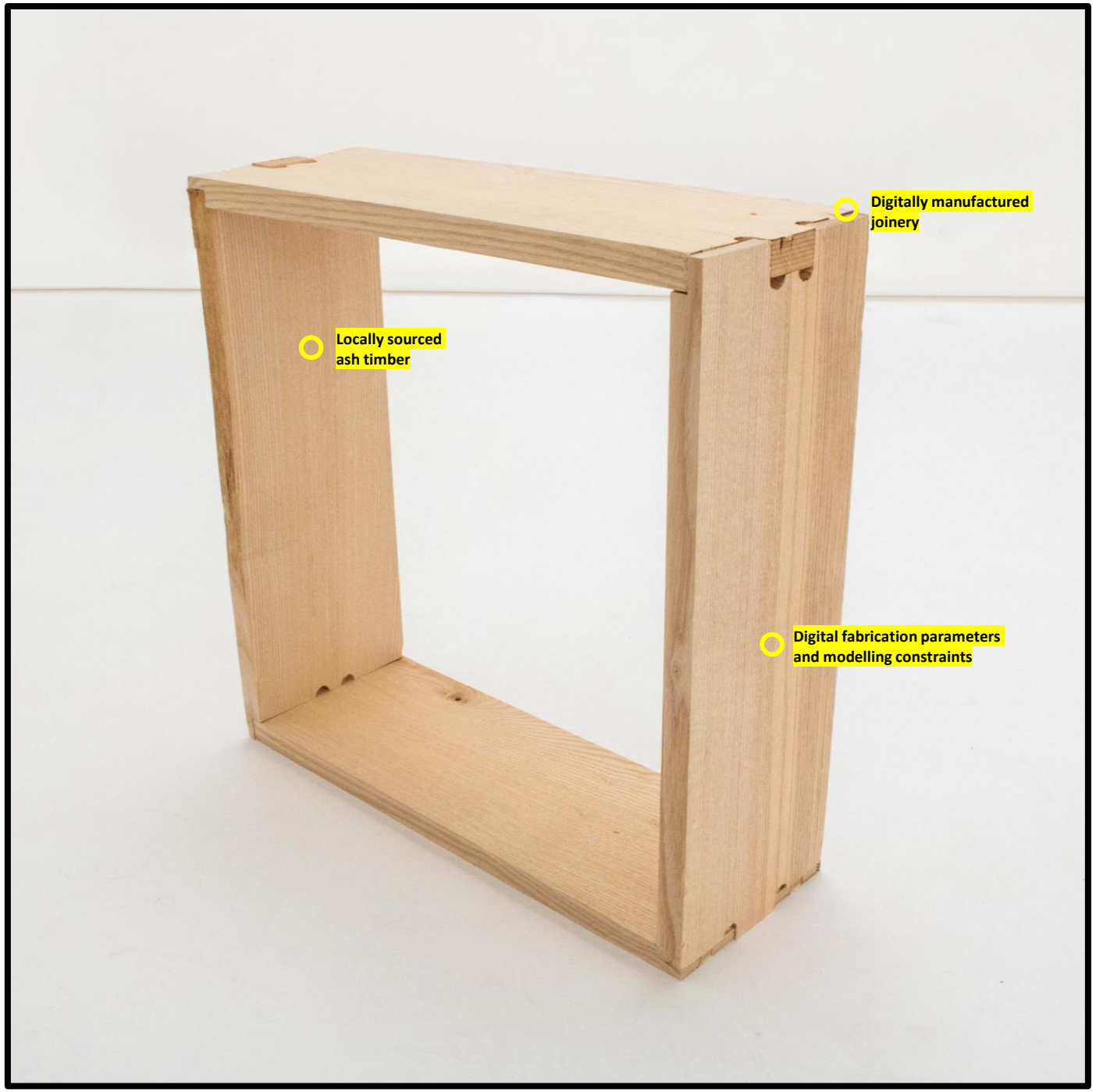
Material approach

(Co)design and prototyping through digital fabrication

Prototype panel, University of Plymouth Digital Fabrication Laboratory.
Image source: A. Carr, 2022..

Material approach

(Co)design and prototyping through digital fabrication



Prototype panel, University of Plymouth Digital Fabrication Laboratory. Image source: A. Carr, 2022..

Biogenic

An average timber frame home sequesters 19 tonnes of carbon

Wood for Good

Hempcrete sequesters 165kg of carbon per cubic meter

Lime Technology

Material Cultures: Margent Farm

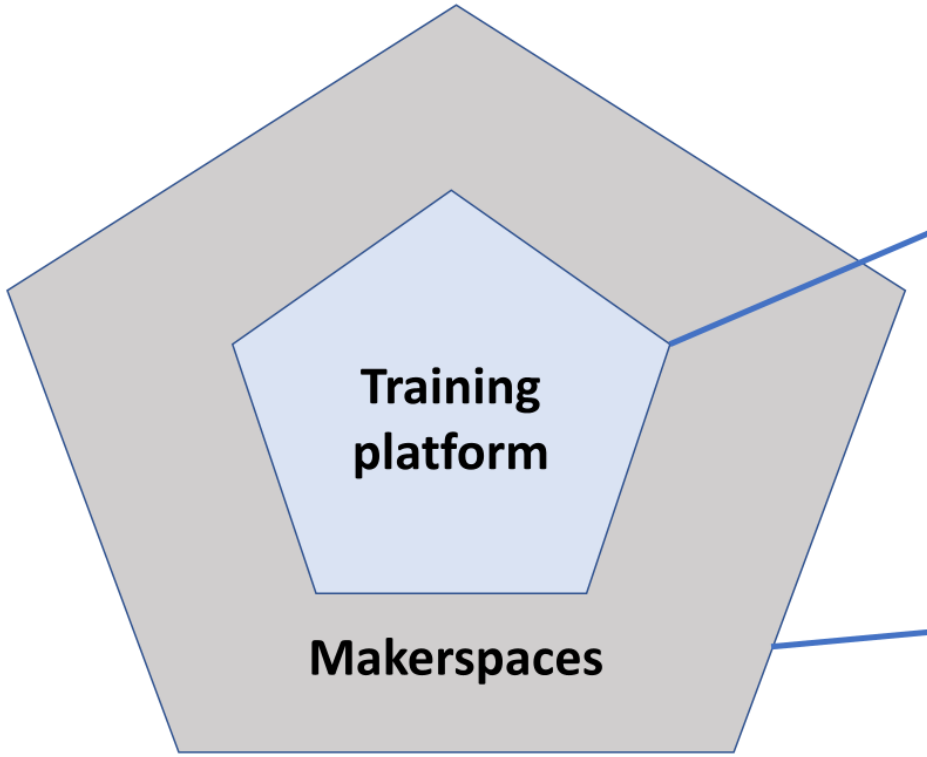
DunAgro – Netherlands: An example of timber-hemp panels

Material approach

(Co)design and prototyping through digital fabrication

Insulation studies, University of Plymouth Digital Fabrication Laboratory.
Image source: A. Carr, 2022..

Denhay Farm: Makerspace & Training Facility



Training platform

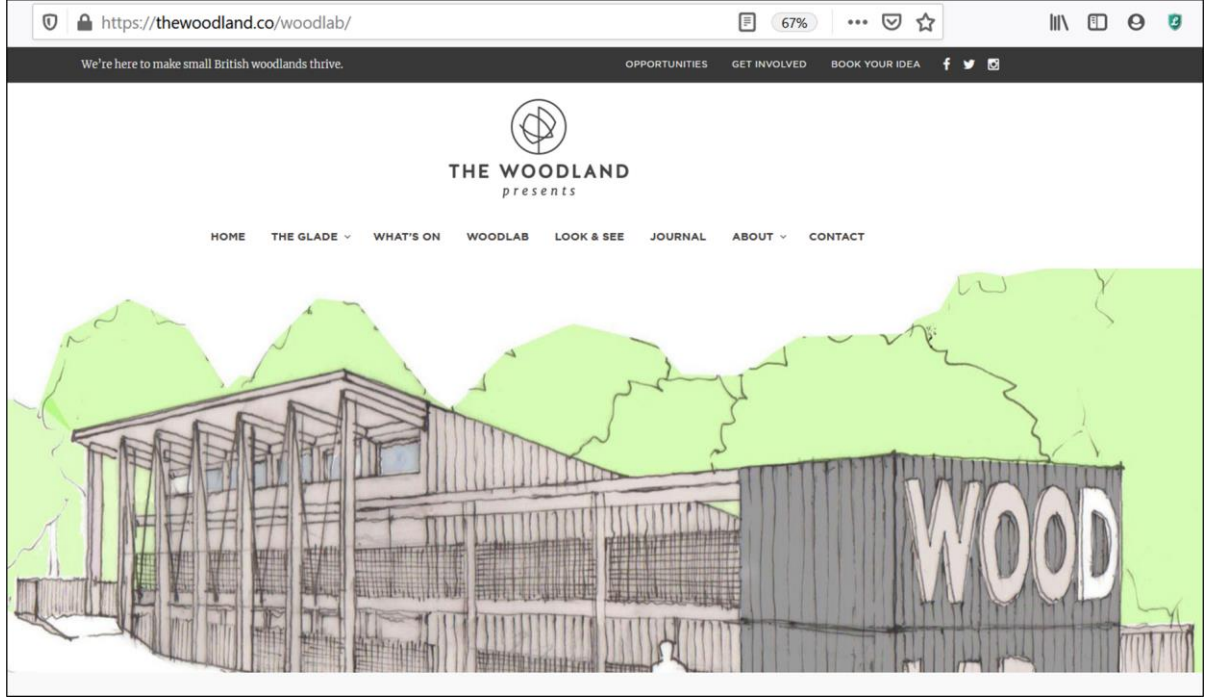
Provides:

- Common branding
- Educational framework
- On-line content
- Website + plug-ins
- Teaching materials
- Marketing/promotion
- Quality assurance
- Admin templates
- H+S / Risk assessments

Makerspace

Provides:

- Facilitation/tuition
- Workspace
- Equipment & Machinery
- Local community engagement
- Administration
- Accommodation options if appropriate


https://thewoodland.co/woodlab/
67%
We're here to make small British woodlands thrive.
OPPORTUNITIES
GET INVOLVED
BOOK YOUR IDEA
THE WOODLAND
presents
HOME
THE GLADE
WHAT'S ON
WOODLAB
LOOK & SEE
JOURNAL
ABOUT
CONTACT
WOOD


F 700 Z
FELDER

Partners

- Assemble
- Common Practice
- Common Ground
- Bridport Area Community Housing
- Bridport Town Council
- University of Plymouth
- Woodlab & Wikihouse
- Local farmers & foresters
- Dorset Community Energy
- Stir to Action

Denhay Workspace

- **Materials**
  - Sourcing
  - Processing
- **Training & Education**
- **Research & Prototyping**
- **Off-site fabrication**

Outputs

Community Buildings
- Common House
- Trill Barn

Affordable Housing
- Foundry Lea
- Burton Bradstock

Energy & Retrofit
- Boldwood House

Textiles
- Fibre mill
- Furnishings for warmth

Vocational training workshops	**Materials workshops**	**Community workshops**	**Creative workshops**
Retrofitting for energy efficiency	Timber from the SW: sourcing & uses	Basic carpentry	Ceramics
Carpentry and joinery by hand	Fibres: hemp, flax, straw, wool	Furniture design & making	Paper-making
Modern methods of construction	Local clays: for bricks & plasters	Exploring natural materials	Screen-printing & Wall-paper printing
Digital design & fabrication	Lime	Repairs, Recycling & Upcycling	Working with felt
Use of natural materials	Seaweed as a binder or for composites	Using reclaimed materials	Working with hazel, willow, reed
Circular economy	Charcoal & biochar	Textiles	Stone carving
Finance, planning & building regs	Stone & Chalk	Home furnishings	Interior colour design
Accessibility requirements	Rammed earth	Energy efficiency improvements	Garden design & landscaping

RESOURCES

- Workspace
- Hand tools & machinery
- Materials (inc timber from local woodhub)
- Network of Tutors
- Delivery framework
- Enrolment process
- Website

PARTNERS

Raise the Roof core partners
Arts Development Company
Bridport Area Community Housing
Bridport Town Council
Common Ground
Dorset Woodhub
Wessex Community Assets

OPERATIONS/ ACTIVITIES

Courses in:

- Carpentry & joinery
- Green woodwork
- Sustainable construction
- Design & make for production, e.g. for furniture and fittings
- Woodland Ecology
- Woodland Creation
- Woodland mgt
- Extraction
- The Timber Processing Chain
- Machinery Operation
- Social forestry approaches
- Social prescribing – "woods for well-being" plus crafts/making

OUTPUTS/ VALUE PROPOSITION

Learners will benefit from:

- Access to new knowledge
- Gaining new skills
- Industry integration
- Potential career change
- Workspace
- A community of peers

Linked to practical and socially useful making of things such as furniture, buildings, wood stores, animal architecture, renovating community spaces.

Post-COVID recovery: making and creating is good for mental health.

Capacity-building & enhanced community cohesion through working on practical projects together.

PROMOTION/ MARKETING CHANNELS

- Through the network of partners.
- Dedicated website: www.raisetheroof.info
- Social media
- Community events
- Press releases.

CUSTOMER/BENEFICIARY RELATIONSHIPS

During training courses:

- Co-creative focus
- Emphasis on building capacity & confidence
- Practical & immersive experience

Online:

- Supportive resources
- Forum space
- Mentoring & Business start-up support

BENEFICIARIES/ CUSTOMER SEGMENTS

People who are unemployed or in low paid, precarious employment.

Local 18 – 40 women + men eager to re-train, upskill, or supplement previous education & training.

People keen to access affordable housing through self-build/self-finish.

People referred by GP's and other agencies for "social prescribing" activities/"green gyms".

bridport cohousing

The UK’s biggest cohousing project
- 53 affordable, eco-homes
for local people
- shared ownership and social rent.

HAZELMEAD COMMON HOUSE [PHASE ONE]

KEY FIGURES

Footprint	130 m2
Residents	100+
Volunteers	25+
Material Travel Miles	8.1 miles (at present)
Local Douglas Fir	12.8 m3
Barley Straw Bales	328
Recycled Car Tyres	42
Local Clay	2 Tons

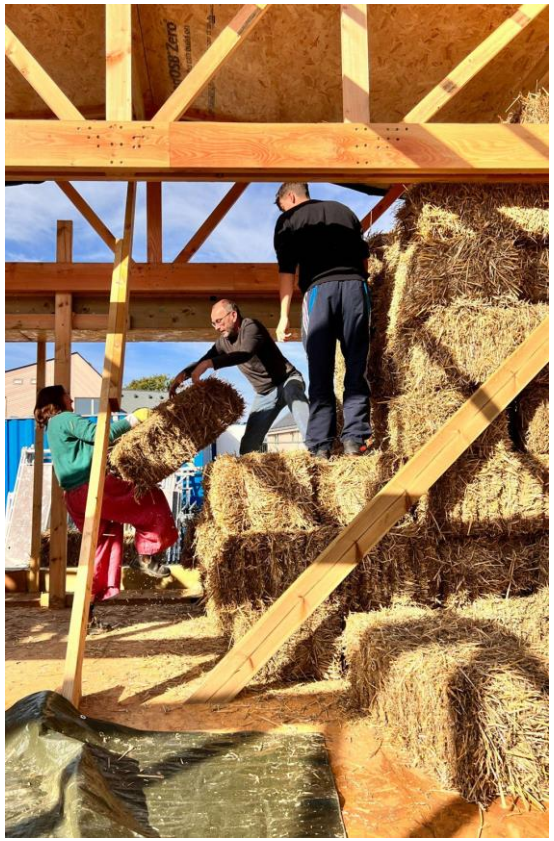
Common House Sourcing Map

1. Denhay Farm grows and bales barley. Clay for plaster is excavated. Common Practice hosts off-site fabrication in their workshop.
2. Douglas Fir grown and harvested through Continuous Cover Forestry methods.
3. Lime Plaster purchased from Mike Wye Ltd.
4. Cedar is grown and Douglas Fir is milled.


DENHAY FARM
2.5miles
EGGARDON SAWMILL
4.7miles
COMMUNITY MADE STRUCTURAL INSULATED PANELS (SIPS)
U-VALUE = 0.18 W/m²K
COMMUNITY BUILT STRAW BALE
BALE - RENDERED w/ LIME (INT) CLAY (EXT)
U-VALUE = 0.08 W/m²K
COMMUNITY MADE STRUCTURALLY INSULATED PANELS (SIPS)
U-VALUE = 0.18 W/m²K

Phase One Insights:

Cheaper + Quicker



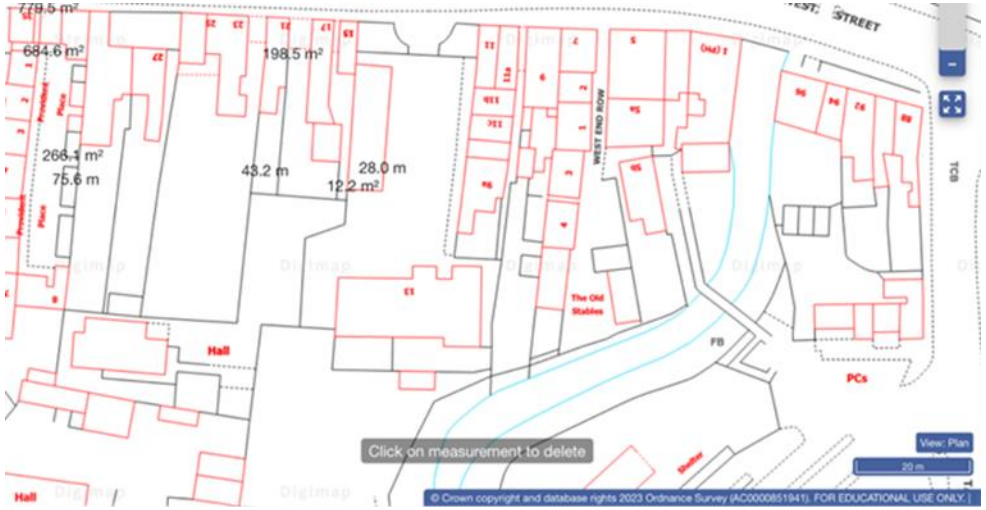
- Construction methodology is designed to be accessible so volunteering is simple

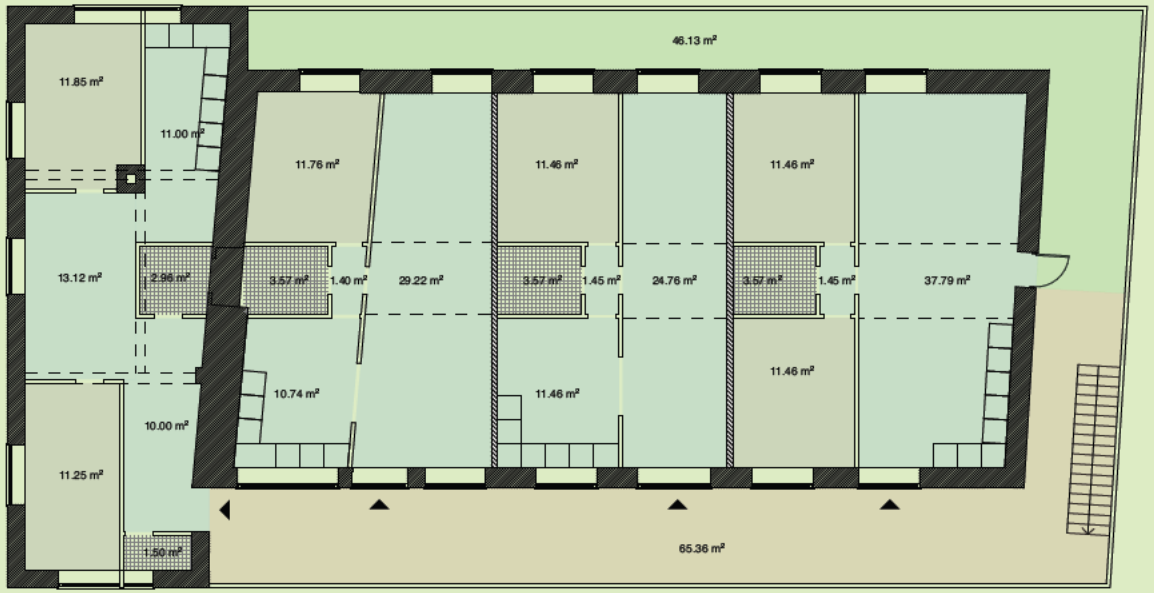
- 1 Bale is £4
  The building uses 300

  The building cost is half as much as the lowest conventional tender

- Picture taken at week 10
  16 Weeks from start of prefab to watertight shell

Boldwood House: partnership with Bridport Area Community Housing, Magna Hsg & Assemble Studio





2 Bed Apt
63.88 m²

1 Bed Apt
58.49 m²

1 Bed Apt
54.41 m²

2 Bed Apt
67.45 m²

Option 3 - Wrapping with access from the North

-Four 1 and 2 bed flats per floor
-Access via North wintergarden
-Private outdoor space via South wintergarden layer

-New wintergarden layer provides access and exterior spaces
-Lift could also be added in the wintergarden zone to make all flats fully accessible
-Some more significant changes to the fabric of the building - many windows become doors
-Internal staircase removed
-External insulation

This option creates a full wraparound that acts as a new thermal envelope for the building, providing access on the North facade and extensions to the flats along the South facade in the form of a new balcony or Winter Garden. This approach enables the existing interior stair to be removed and additional accomodation added.

0 1 2 3 4 5m

Hatch Key:
- Concrete
- Concrete Precast
- Brickwork
- Plaster
- Timber
- Insulation

Private Shared
Private Shared
Private External

Study

Drawing
FF Option 3

Project
Baldwood House

Client
Bridport Town Council

Date
06.02.2024

Drawing No
1365_SK.4

Drawn by
Amy Perkins

Scale
1:100 @ A3

ASSEMBLE
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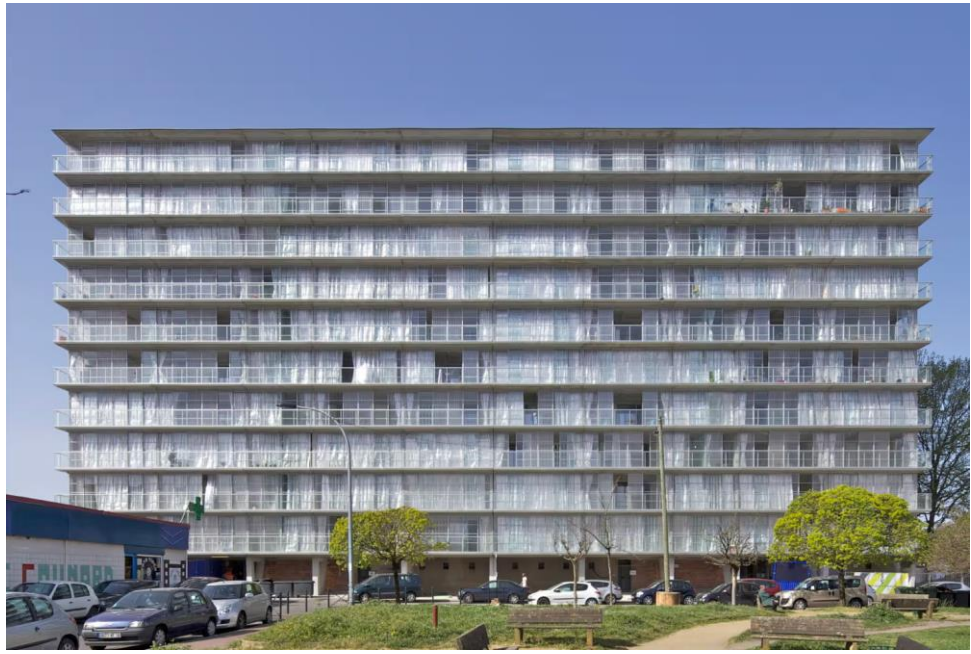
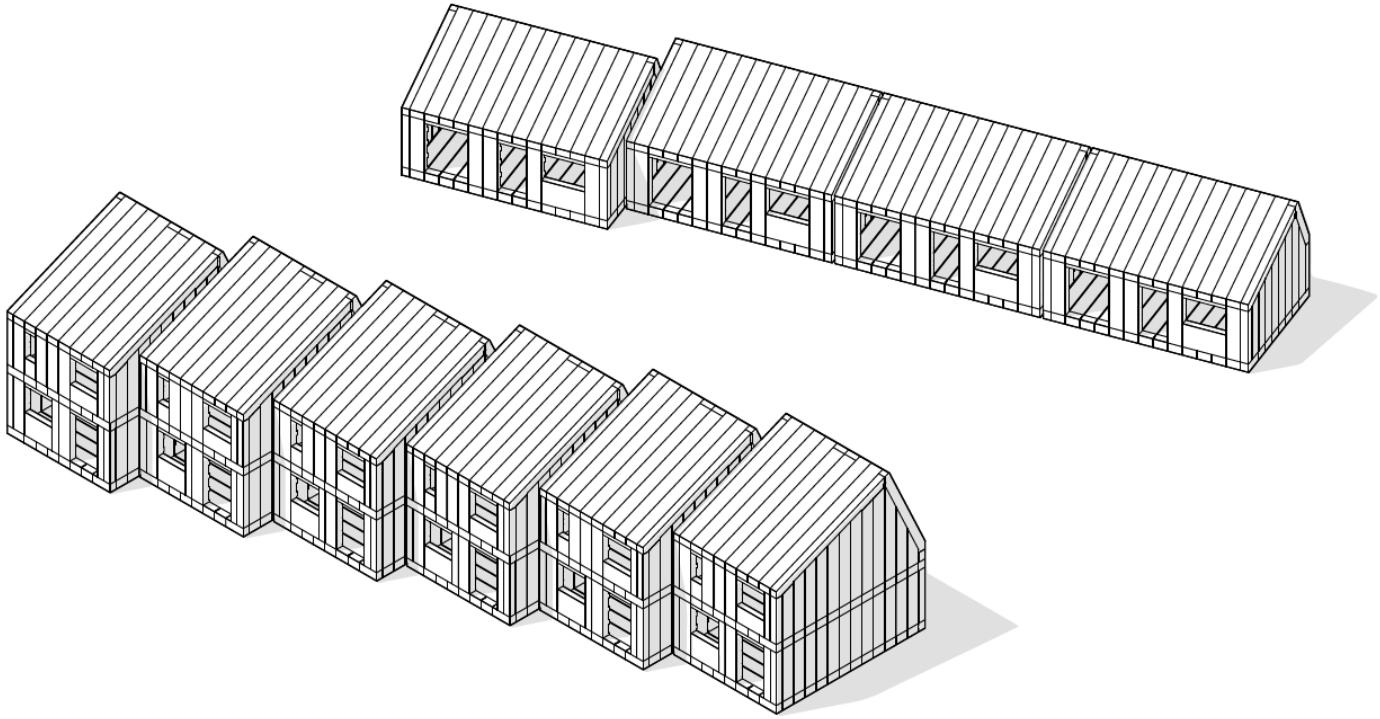
info@assemblestudio.co.uk





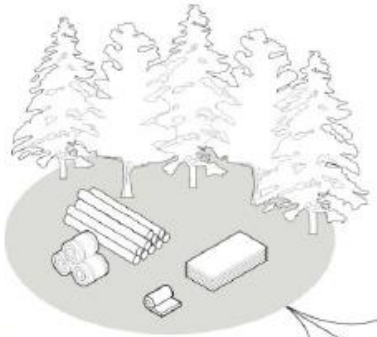
Lancaster Gardens, Whitleigh

Partnership between Whitleigh Community Trust, WCA, Wikihouse, University of Plymouth

Community & local production

1. Sustainably forested British timber

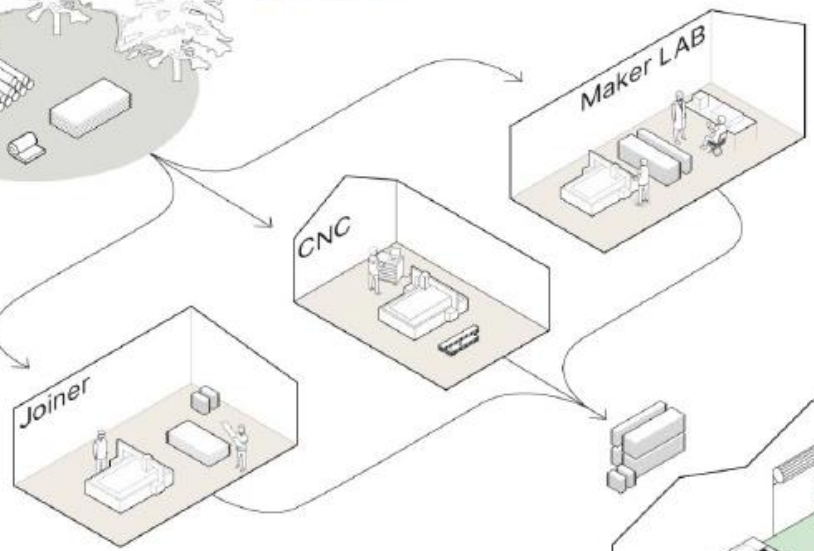
Sourcing materials from local forests, hemp plantations etc



2. Raw materials

UK produced OSB3 sheets x420 per house

Natural insulation batts



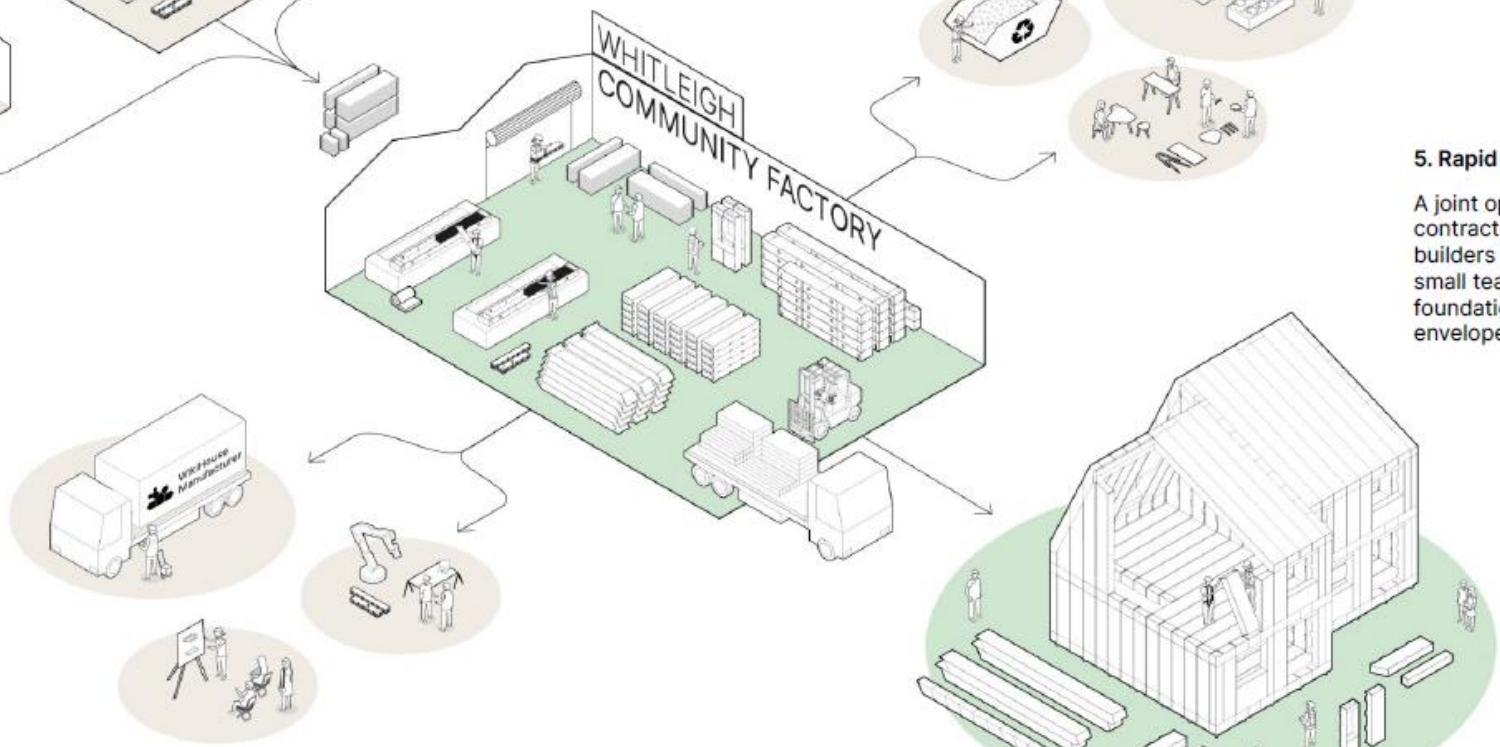
3. Digital fabrication

CNC manufacturing partners across the South-West who can machine parts for WikiHouse blocks.

~15 weeks production for 10 homes

4. Block assembly

Parts can be rapidly assembled into insulated WikiHouse wall, floor and roof blocks by community and student teams or local contractors with the opportunity to provide upskilling and training in DfMA construction



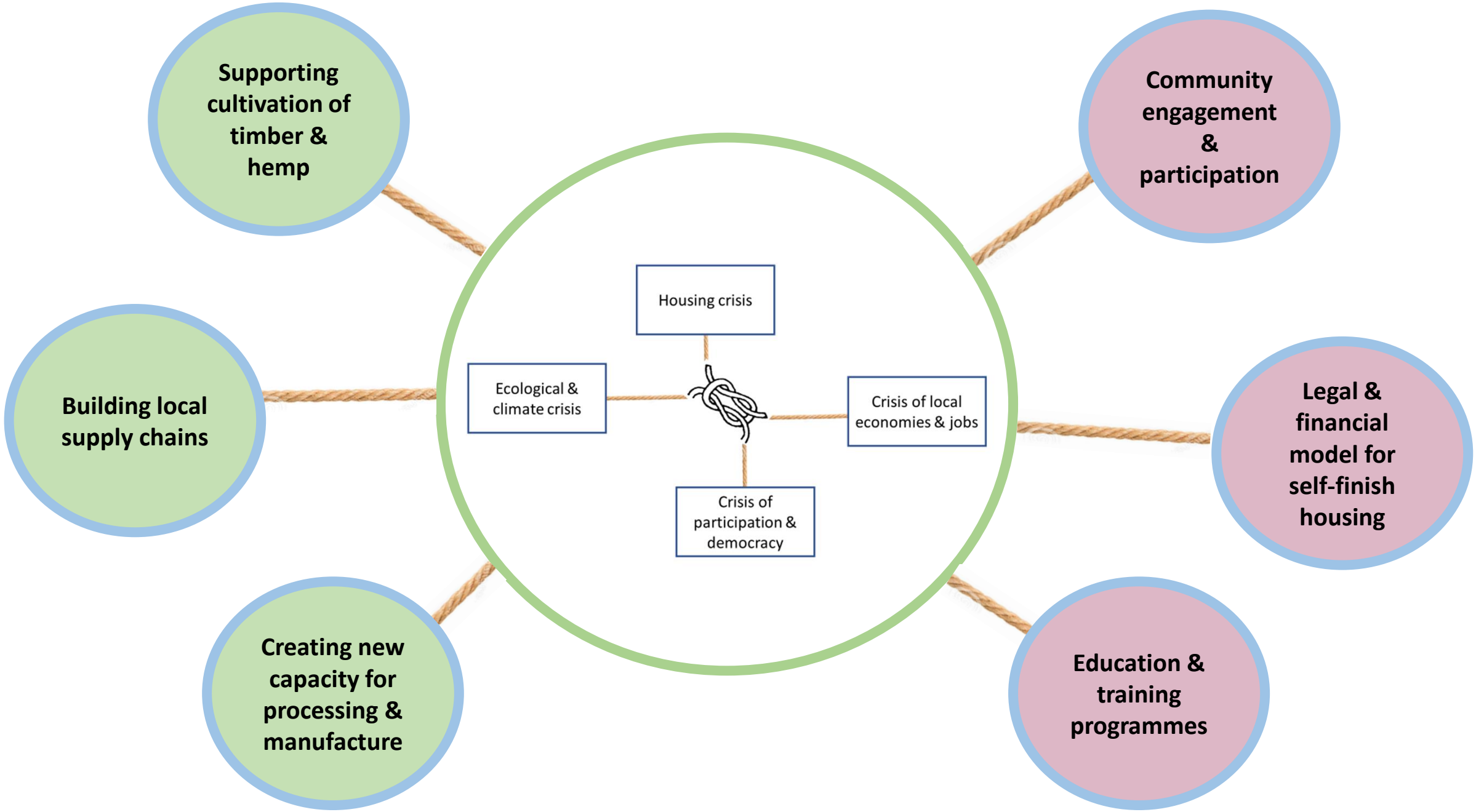
5. Rapid assembly

A joint operation between local contracting team, community builders and student volunteers. A small team can get from foundations to weathertight envelope within 5-7 days

Zero-carbon homes, made locally.

WikiHouse is about more than building homes, but building a local production ecosystem. The simple modular blocks enable developments to leverage local SMEs, skilled trades, and unskilled novices to deliver at scale. Any covered facility local to the site can be temporarily purposed as a WikiHouse community factory hub.

https://wecanmake.org/


Supporting cultivation of timber & hemp
Community engagement & participation
Housing crisis
Ecological & climate crisis
Crisis of local economies & jobs
Crisis of participation & democracy
Building local supply chains
Legal & financial model for self-finish housing
Creating new capacity for processing & manufacture
Education & training programmes