beautiful affordable sustainable building homes for sustainable communities
The ECO-SEE project aims to address an emerging health problem associated with modern low carbon buildings. Modern buildings have been developed to be very airtight, improving their energy efficiency and reducing their carbon footprint. However, these sealed environments have created unexpected side effects, with research showing that a build-up of potentially harmful chemicals in the air is potentially causing negative impacts on occupants.

The ECO-SEE project studies the use of innovative eco-building materials that will address poor air quality, while also radically improving the energy efficiency of buildings.

IsoBio, aims to transform mainstream adoption of sustainable materials in building and construction - delivering significant energy efficiency improvements and wider environmental benefits.

The project runs from 2015 for four years, has a budget of €6,3M, and the development is planned in four significant phases. The first two will focus on taking the materials from idea to application, before emphasis switches to a transition from lab to demonstration scale.
UK has failed to meet housing demand for over a decade.

In 2013 we built 130,000 homes, less than half the demand.

A market failure that has its roots in the 2007 financial crisis.

House prices have risen to the point where access to home ownership is out of the reach of the young and those on low wages. Generation Rent.
Pensions are not performing the way they should.

The UK has relied on a property owning population able to release equity in retirement to close the pension performance gap.

A double whammy of a non-property owning population with poorly performing pensions.

An ageing population without the equity or pensions face the likelihood of living in poverty.

Government has to rethink how housing will be delivered at scale.
Of the 130,000 houses built in 2013, over 15,000 of them were built by self-builders.

Three times more than the largest house builder.

How do you scale self-building?

Self-build requires individuals to build one house at a time, taking longer than they ever imagined & costing more than they hoped!

The government’s approach to resolving this is to develop a what is called Custom Build.
Custom Build is a significant and emerging agenda for the UK.

The Community Right to Build was embodied in the Localism Act.

Self-build and Custom Housebuilding Bill 2014-15 was laid before Parliament as a Private Members' Bill.

Every local authority is obliged to identify land for Custom Build.

Government hopes to scale the Self Build market from 15,000 thousand home in 2103 to 100,000 by 2020 using Custom Build.

The largest change in housing provision in the last 60 years.
100,000 new homes
That’s a new £20bn housing market
it doesn’t exist today
it will by 2020
1.9 hectares per person

america 12 hectares
Europe 6 hectares
inexorable rise of energy and utility costs
40% from the middle east

by 2020 the UK will import 80% of its gas needs - from where?
What's our answer? We have two!
1. Conventional coal-fired power plants release CO₂ directly into the atmosphere. Plants equipped with CCS will capture much of the CO₂ instead.

2. Liquid CO₂ can be transported by pipeline or truck.

3. CO₂ can be injected and stored deep underground.

Depleted oil or gas reservoirs

Alternative possible locations for CO₂ storage

Unmineable coal beds

Deep saline aquifer

Groundwater

Seal rock

Seal rock
The oil and gas industry want us to pay €96 per tonne.
photosynthesis
photosynthesis
photosynthesis - bio evolved quantum machine
photosynthesis - sunlight + water + CO2 = cellulose
742 kg of CO₂ per m³
straw
211 kg per m³
photosynthetic ingredients

Custom Build

wood + straw + lime

screws and glue
projects - BaleHaus at Bath
BaleHaus a Domestic Carbon Bank - 34 tonnes

or

45 years of a 2 kW PV array
Our Experience - LILAC CoHousing Leeds
Our Experience - LILAC CoHousing Leeds
THE ECOS HAVE LANDED
Meet the pioneering eco-warriors living in Bramley, West Leeds. Their environmentally sustainable co-housing project LILAC (Low Impact Living Affordable Community), is the first of its kind in Britain.

Quarterly heating bills £20 - £50 90% less than the average for Leeds

Our Experience - LILAC CoHousing Leeds
Super-insulated and Airtight
Heating MVHR and ASHP
all LED lighting all electric design
Rainwater Harvesting
Plasterboard Free - Compressed Straw Board CSB,
2kW PV per home
£1180m2

Portway, Bristol - Worlds first open market straw bale homes
Custom Build Portway, Bristol - Worlds first open market straw bale homes
LigniCell - Compressed Straw Board (CSB):

- 40 thick
- 60 thick
- Up to 3.2m long
- Up to 3.2m long
- 800 wide
- 800 & 1200 wide
what next for bio-based materials and CO$_2$?

circular materials
Lignin is a complex polymer of aromatic alcohols known as monolignols.

Lignin is an integral part of the cell walls of plants.

25% of a plant's cell wall is made of lignin.

After cellulose, lignin is the second most abundant renewable carbon source.
Metamorphic bio-based materials

Application of heat and pressure to cellulose materials:

- Heat causes naturally present moisture to be turned to steam
- Steam liquifies lignin in cell walls
- Lignin is a long chain molecule
- Long chain molecules act as bonding agents
- Pressure forces materials together into a self bonded whole
- Straw can become load-bearing board materials
LigniCell - manufactured using Stramit Machine Technology
Stramit Machine Technology - Celebrating 70 years of continuous innovation
- Cross Party Support
- Customer Demand
- NPPF
- HCA Pilots
- CIL Exemption
- Custom Build Association within NaSBA
- Mortgage Products
- S106, Consumer Marketing, Public Land
67% would not buy from a volume housebuilder
53% want to Custom Build at some stage
30% want to Custom Build in next 5 years
12% want to NOW = 6 million people
80% use Rightmove = 400k per month
Igloo Regeneration Custom Build - Trevenson Park Marketing has started target to deliver 3,000 homes per year
Detail planning secured 30 January 2015
Flying Factory in Devon
Passed Judicial review 22 March

Igloo Regeneration Custom Build - Trevenson Park Marketing has started
Custom Build

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Custom Build

3 and 2 storey options with pitched or terraced roofs
BaleHaus Custom Homes Design Code Compliance
Custom Build

rear elevations
Ermine Way - Site Led CoHousing and Custom Build

- 29 x 3 Bed Houses
- 4 x 2 Bed Houses
- 2 x 4 Bed Houses
- 2 x 3 Bed Houses
- 6 x 2 Bed Apartments
- 6 x 1 Bed Apartments
- 1 x Common House
- 6 x Bin / Cycle Storage

50 Units
1.145 Ha
Ermine Way - Site Led CoHousing and Custom Build
Vallis Road, Frome 70 BaleHaus homes
carbon capture & storage

why the built environment?

it’s an asset
sits on the balance sheet
insured
maintained
has utility
where we work rest and play
it increases in value over time

carbon dioxide pumped under in the north sea does none of this
Balehaus®
custom homes
BEAUTIFUL AFFORDABLE SUSTAINABLE

building homes for sustainable communities