

balehaus[®] custom homes

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



NATURALLY HIGH
PERFORMANCE
INSULATION



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

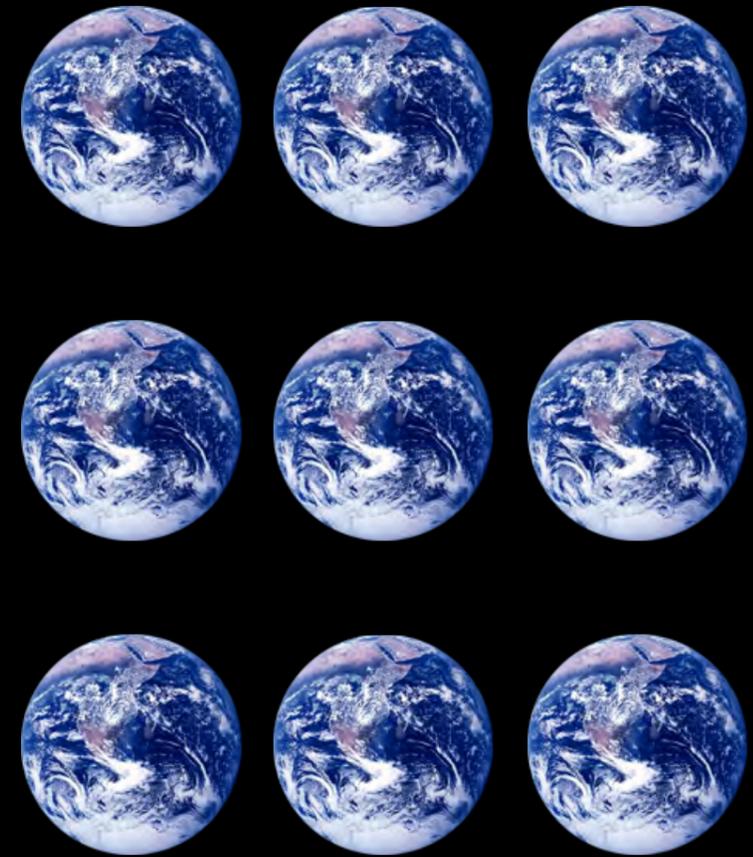
That's a new £20bn housing market

it doesn't exist today

it will by 2020



1.9 hectares per person



america 12 hectares
europe 6 hectares



Custom Build

inexorable rise of energy and utility costs

40% from the
middle east

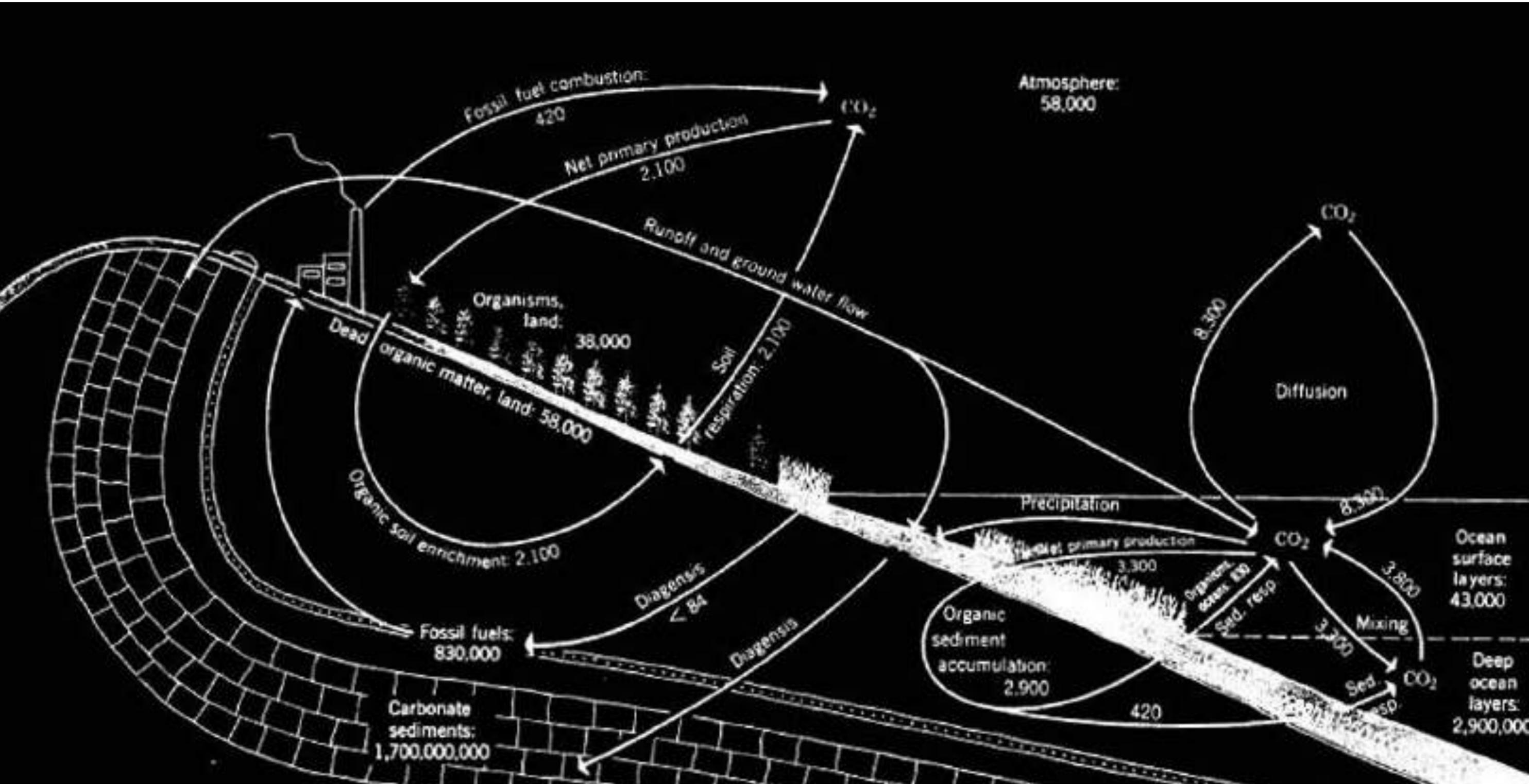


40%

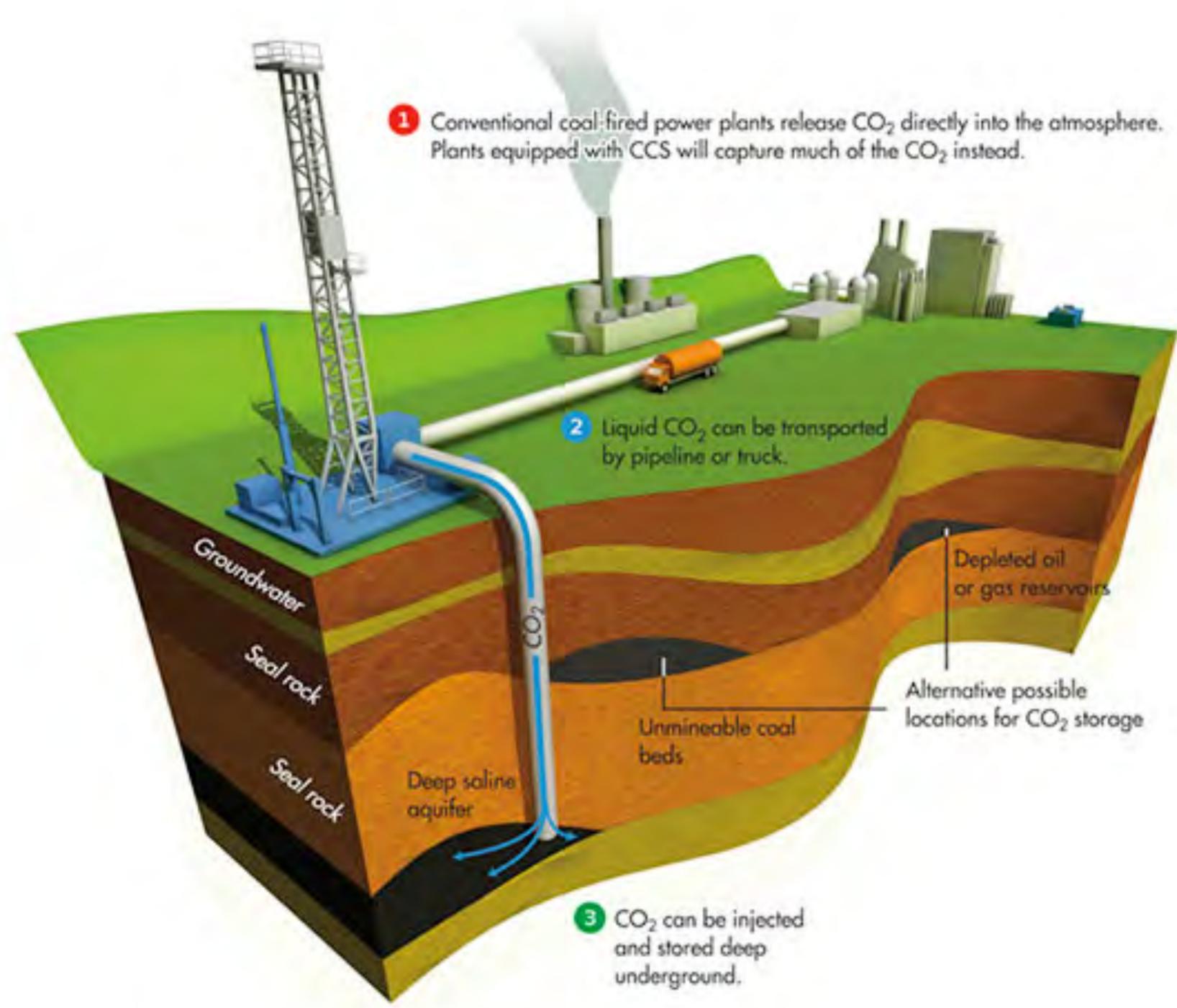


by 2020 the UK will import 80% of its gas needs - from where?

gas supply strategic risk



carbon cycle



The oil and gas industry want us to pay
€96 per tonne



bp

We're bringing oil to American shores.

We're bringing oil to American shores.



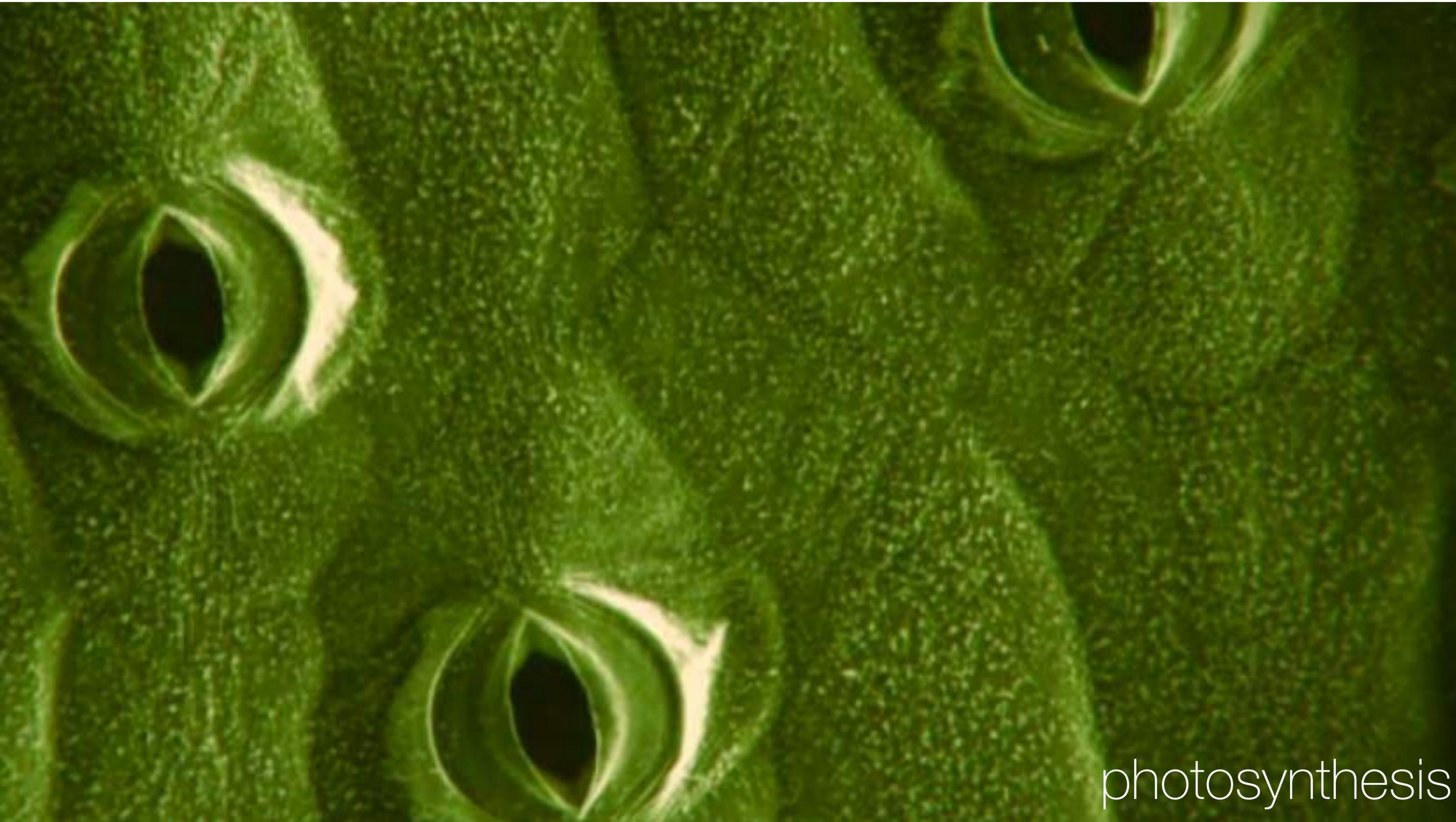
photosynthesis



photosynthesis



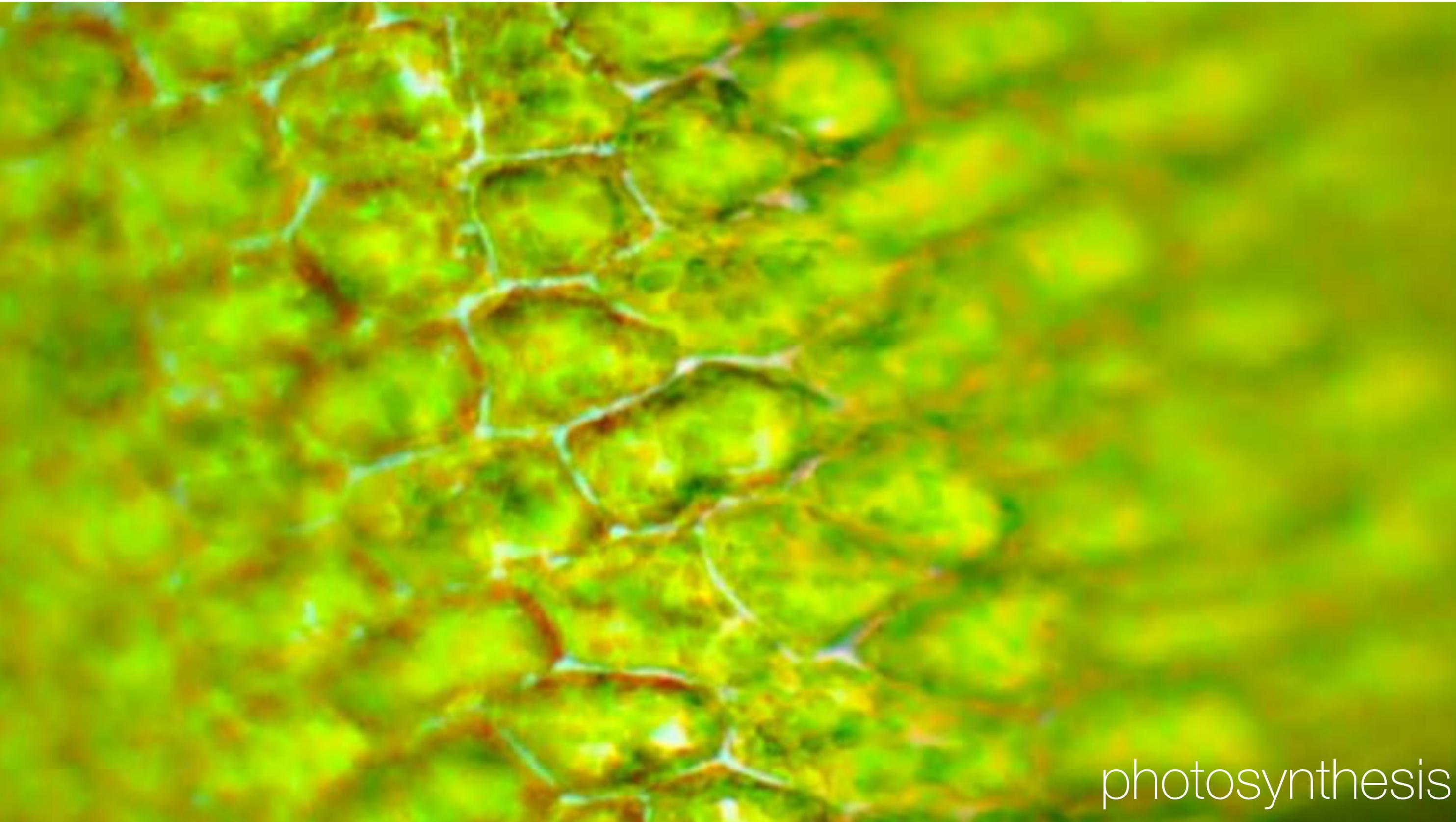
photosynthesis



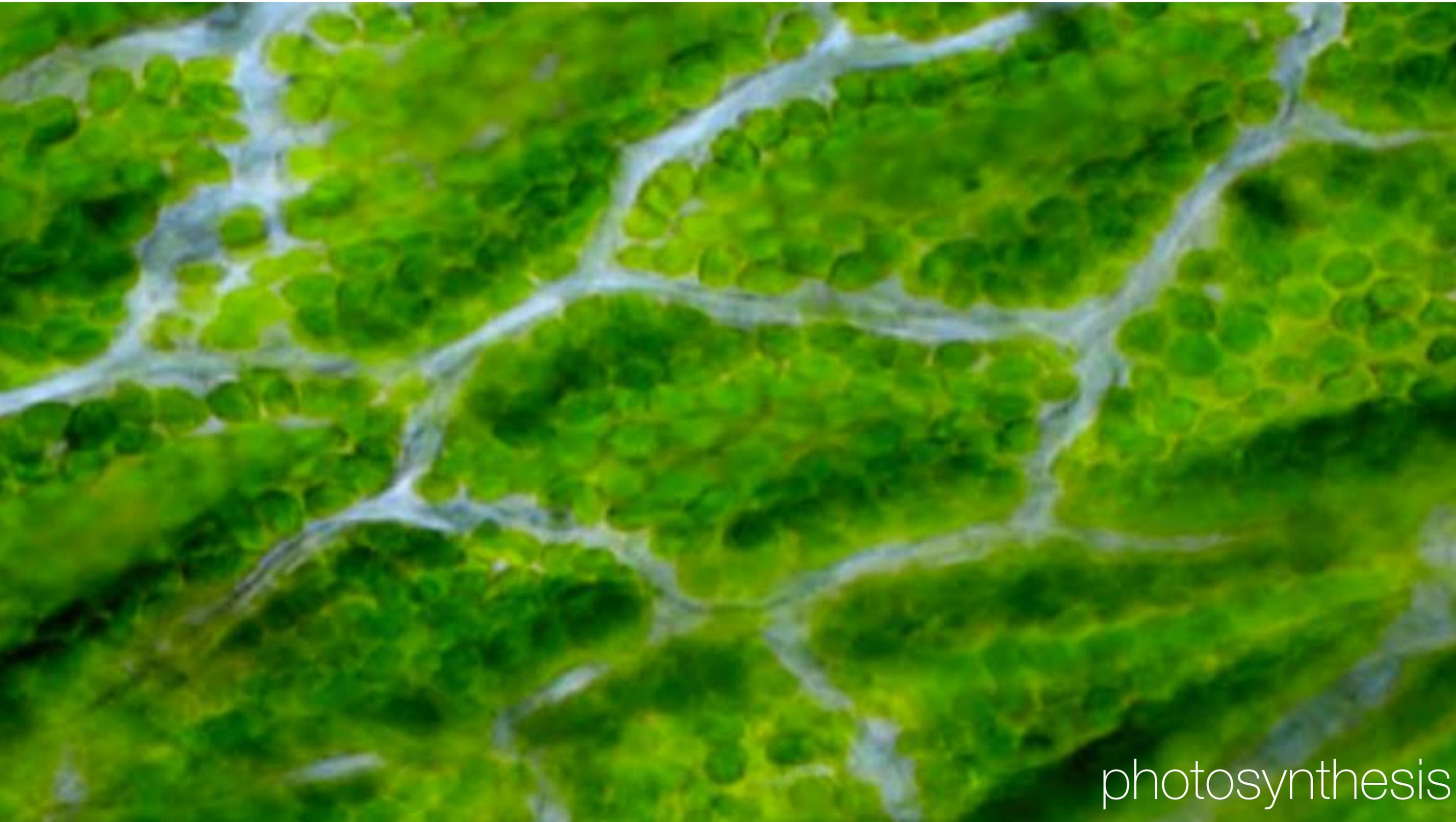
photosynthesis



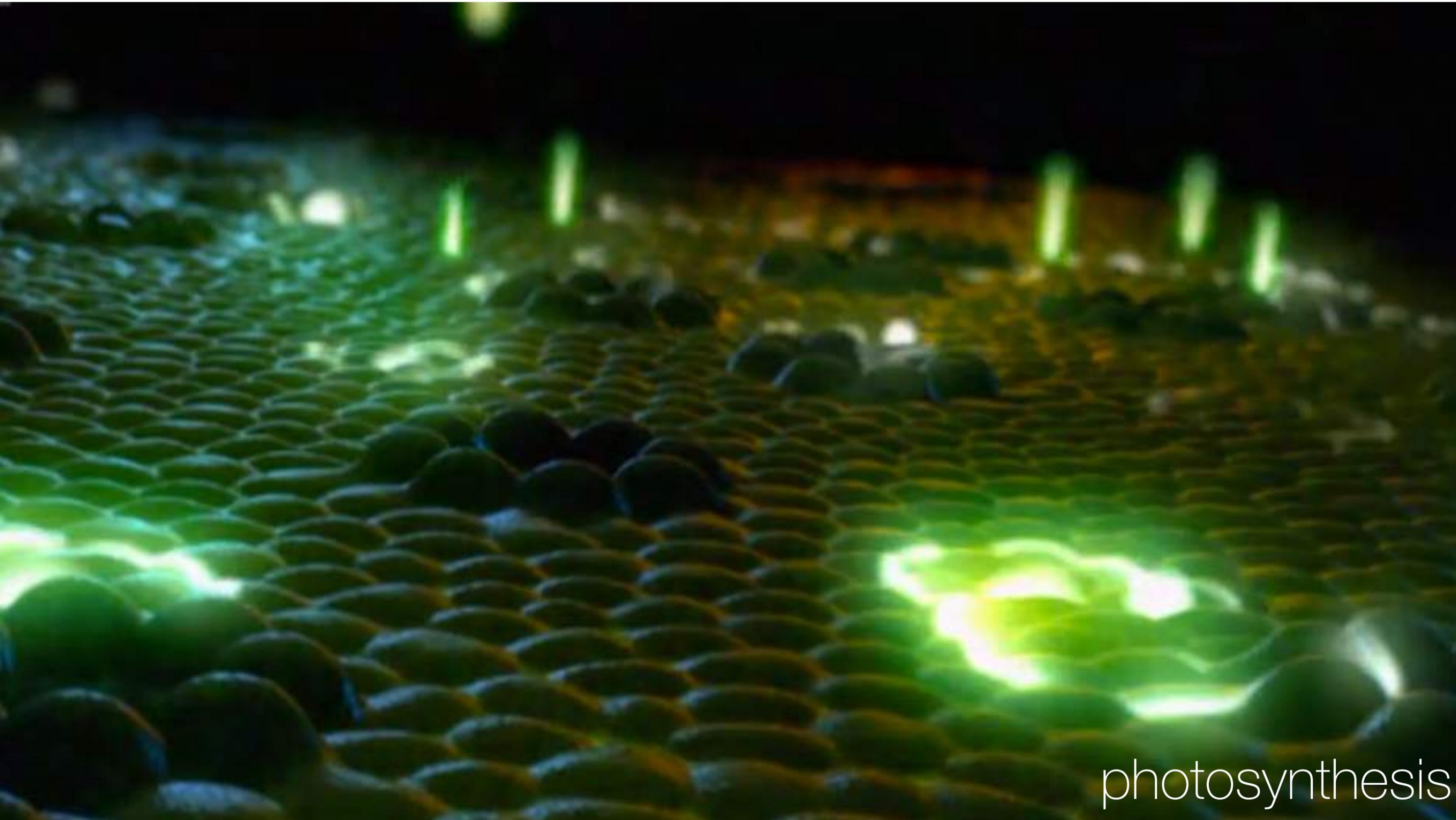
photosynthesis



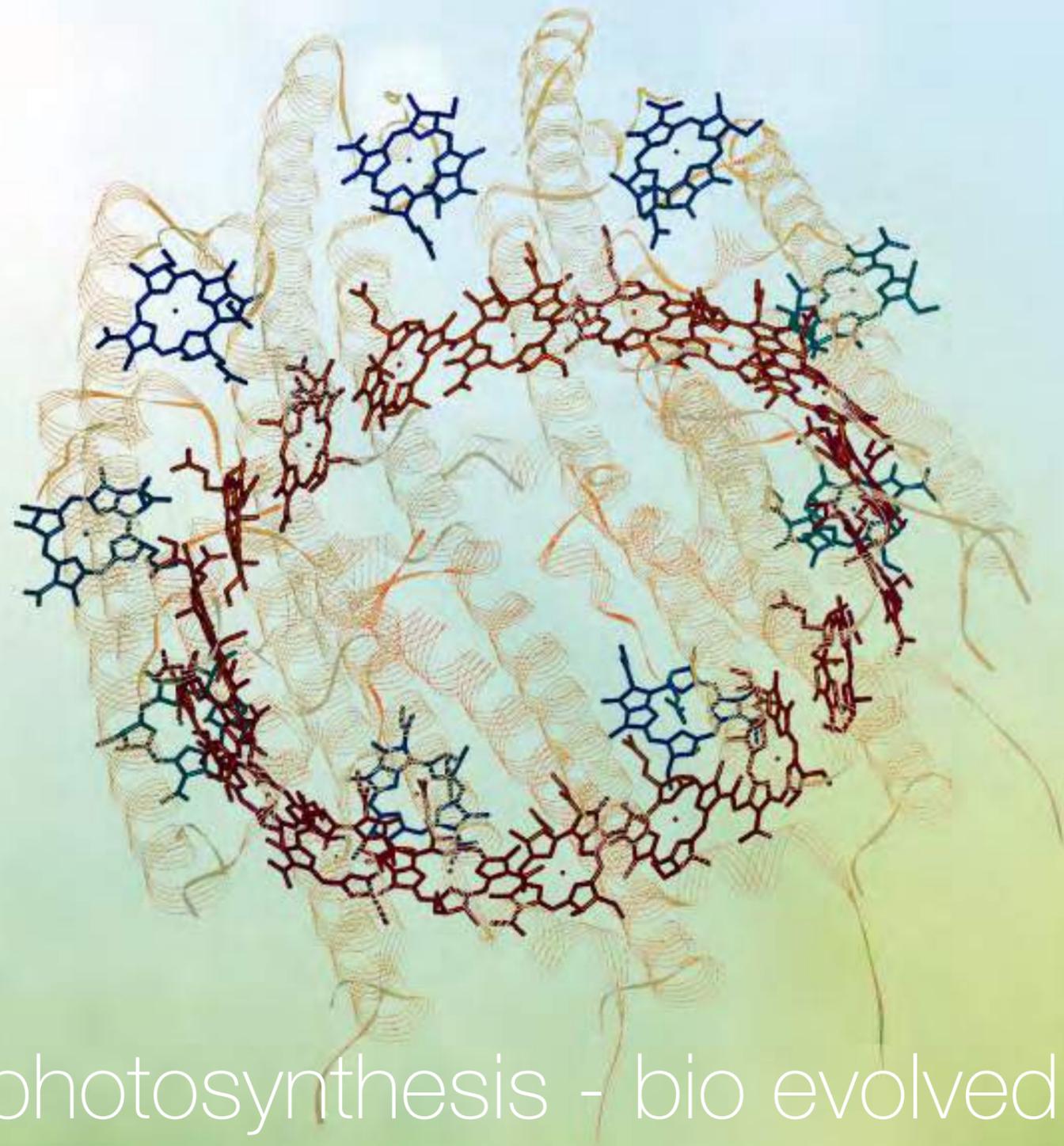
photosynthesis



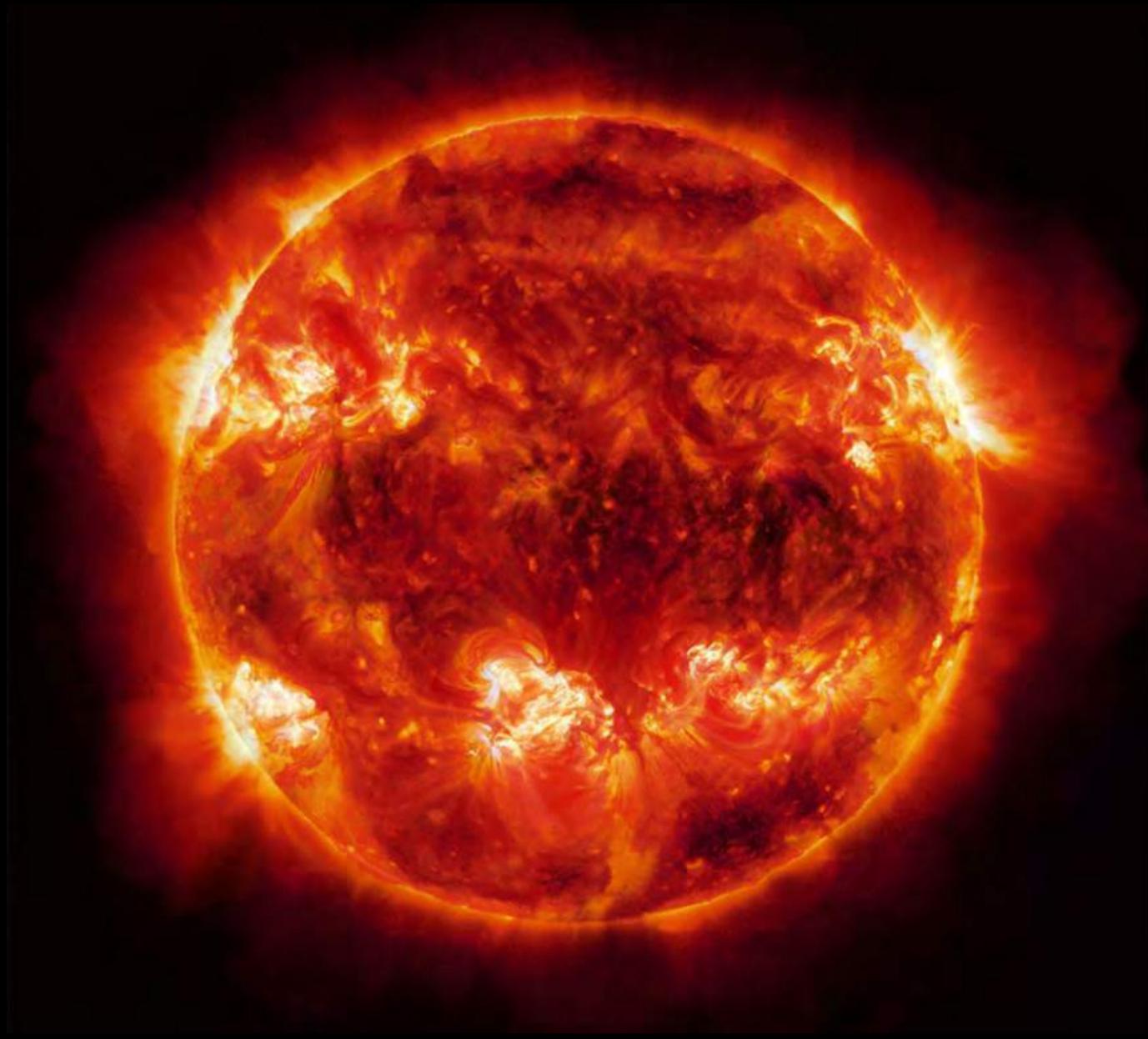
photosynthesis



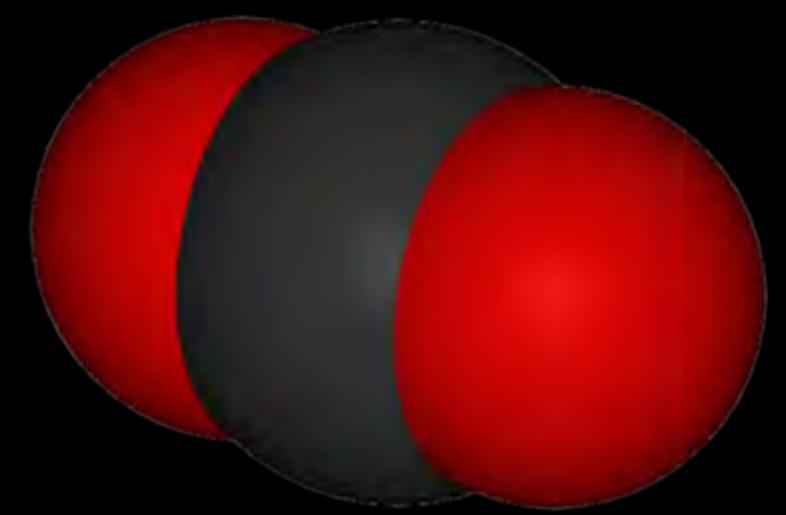
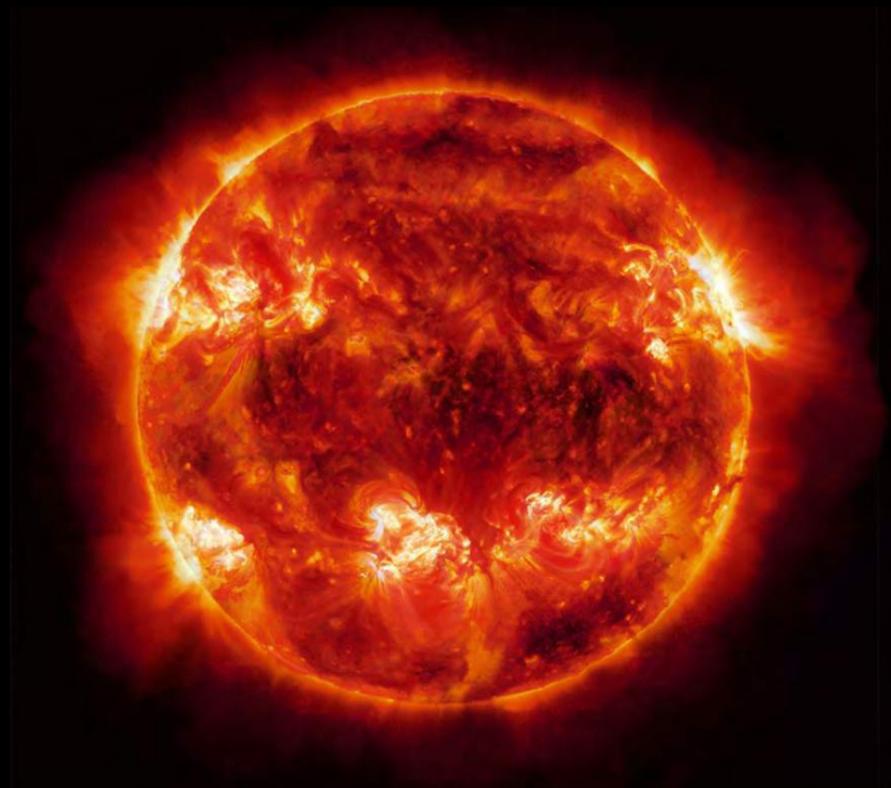
photosynthesis



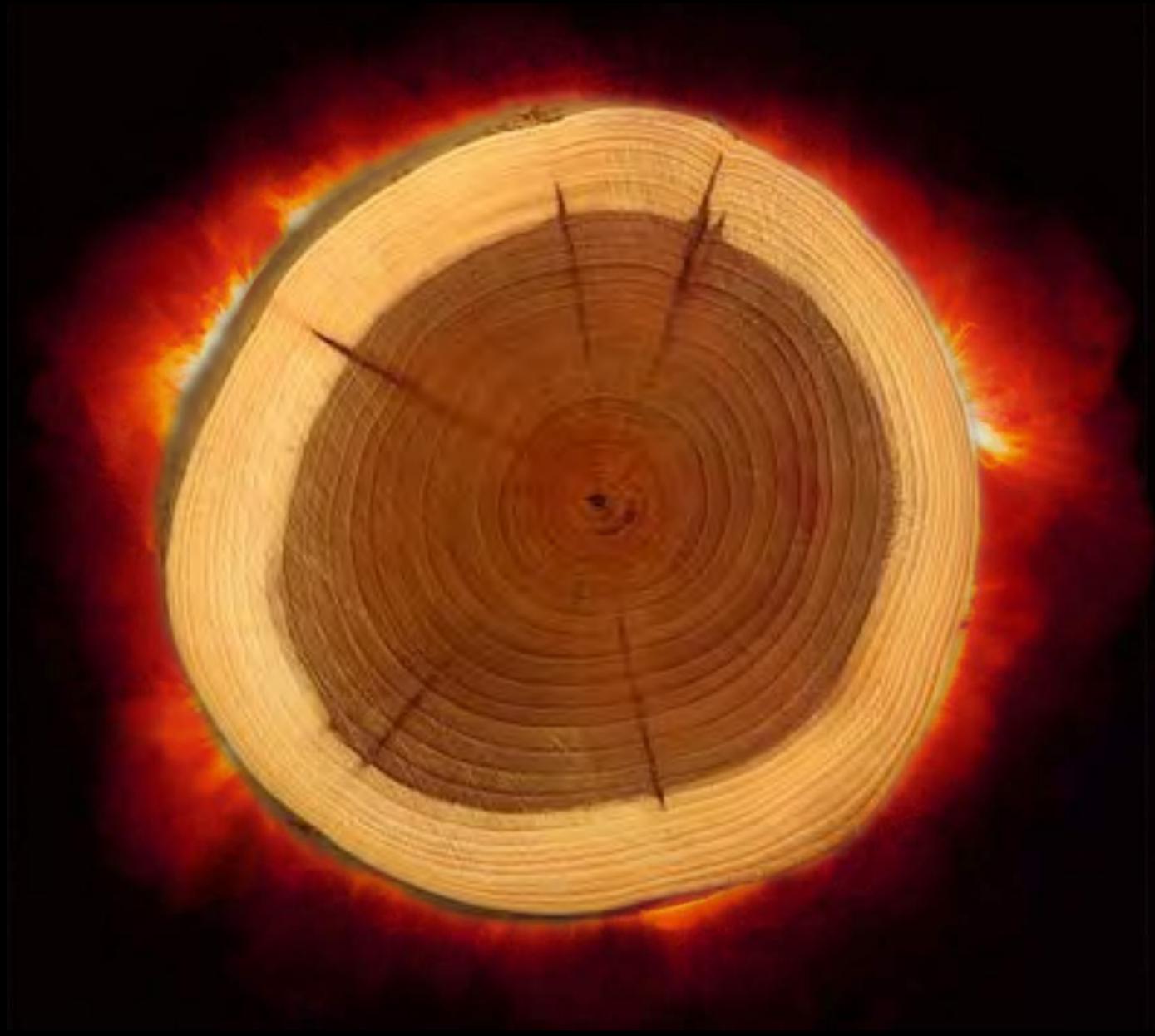
photosynthesis - bio evolved quantum machine



photosynthesis



photosynthesis - sunlight + water + CO₂ = cellulose



742 kg of CO₂ per m³



straw
211 kg per m³



wood

+



straw

+



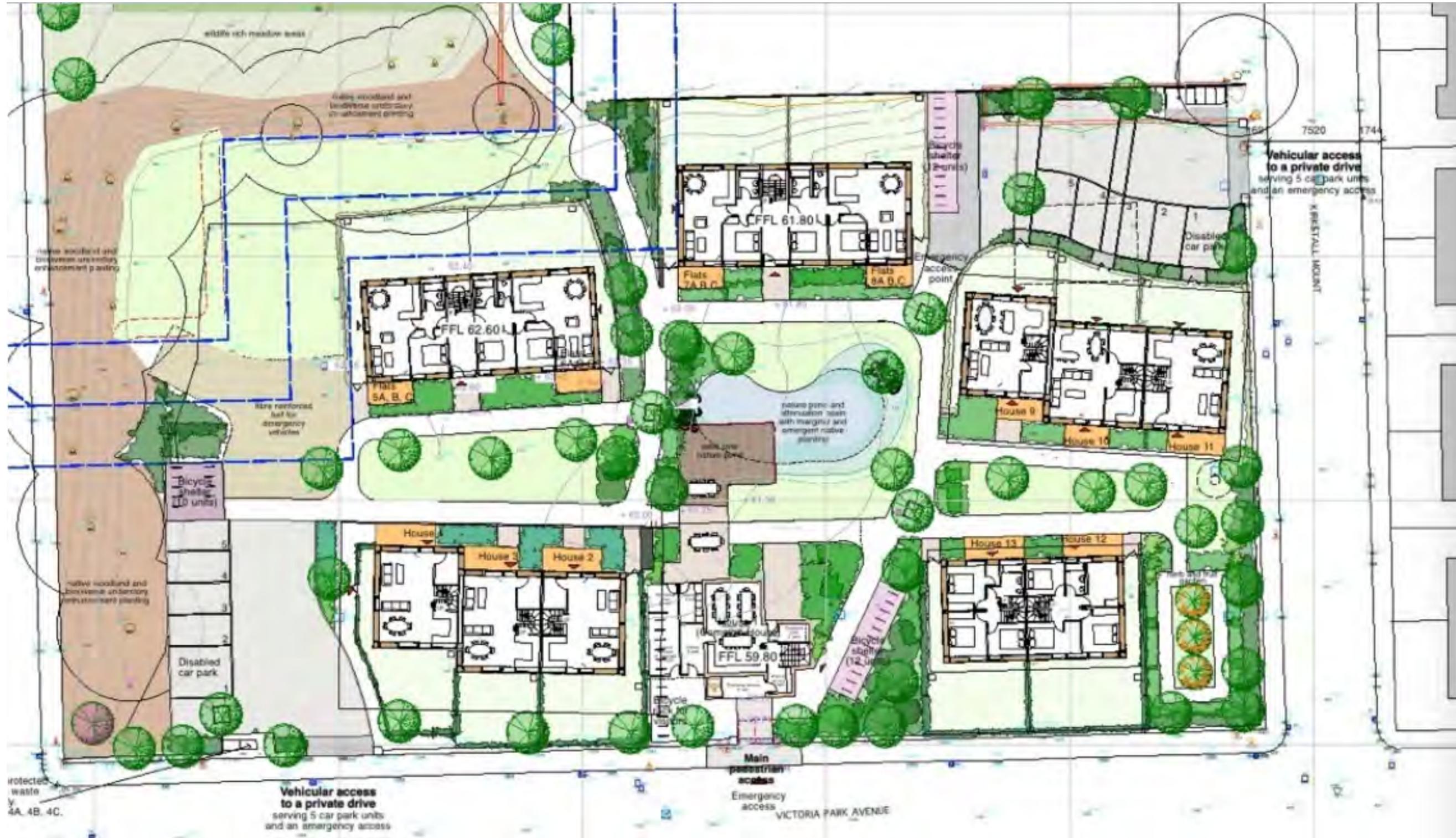
lime
(render)



screws and glue









Custom Build

Our Experience - LILAC CoHousing Leeds

REAL BRITANNIA

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

• **AVELINO MANUEL, 48, BIOMEDICAL SUPPORT WORKER, AND HIS SON SAMUEL, 4**
I used to live in Portugal, in a community of farmers who supported one another, collecting grapes together, digging potatoes. My wife and I were happy to find this place. We child-share with the families in the other houses [in the development behind the fence]

• **LAURA SMITH, 54, BIOLOGY TEACHER**
I sold my four-bedroom house to move here. We grow vegetables, car-share, order bread and food from other local co-ops. Our carbon footprint is 2-tonnes a year, compared to the average household, which is about 10 tonnes

• **ROBIN FISHWICK, 53, CHAPLAIN AND SUPPORT WORKER**
I feel I'm leaving the right type of legacy for my daughters, Rosa [below] and Grace. I want them to have a sense of how to live well – not just live in a property they can use

• **BETH OXLEY, 30, TRAINEE CP**
It can be intense living here – it's important to get the balance between community and personal time. We hold meetings to discuss issues. Every decision is made by consensus, which isn't always easy

• **MIKE HILL, 31, SUPPORT WORKER**
People think I live in a place full of naked people running around. I wish that were the case! We pay 35% of our income to live here. I earn £13,500. It's amazing that on my salary I can live in the heart of Leeds in a place like this

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

• **BRENDA GOSLING, 75, VOLUNTEER AND REIKI SPECIALIST**
I live here with Clive, 79, who I met through a meeting about LILAC four years ago. We had a lot in common: both widowers, and interested in anything ecological. I love gardening and have an impulsive, adventurous side to me

• **RICHARD THOMPSON, 34, IT PROJECT MANAGER, AND HIS DAUGHTER AMBER, 3**
The walls of our houses are made of timber, with tightly packed straw bales under layers of rendering. They really hold the heat in. My average monthly gas and electricity bill is £20, compared to my colleague who pays £140!

• **ROSA FISHWICK, 9**
I enjoy stepping outside the door and always seeing someone I know. I'm the oldest of the little ones, we play all the time, and mummy is teaching me to garden. We've been here six months but it still feels like a holiday camp

INTERVIEWS BY CLIO WILLIAMS
PHOTOGRAPH BY MUIR VIDLER

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

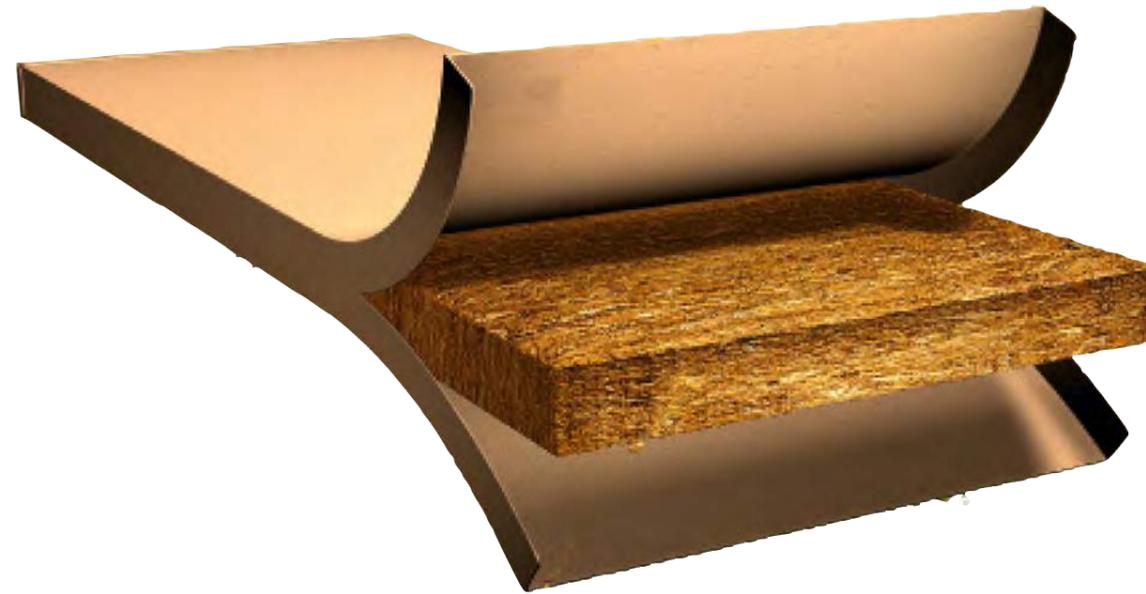








LigniCell - Compressed Straw Board (CSB):



LigniCell







what next for bio-based materials and CO₂?

The logo consists of the text 'circular bio' in a lowercase, sans-serif font. The 'c' is dark grey, the 'i' is dark grey, the 'r' is a gradient from dark grey to olive green, the 'b' is bright yellow, the 'i' is bright yellow, and the 'o' is bright yellow. Below the 'bio' part of the logo, the words 'circular materials' are written in a smaller, dark grey, lowercase sans-serif font.

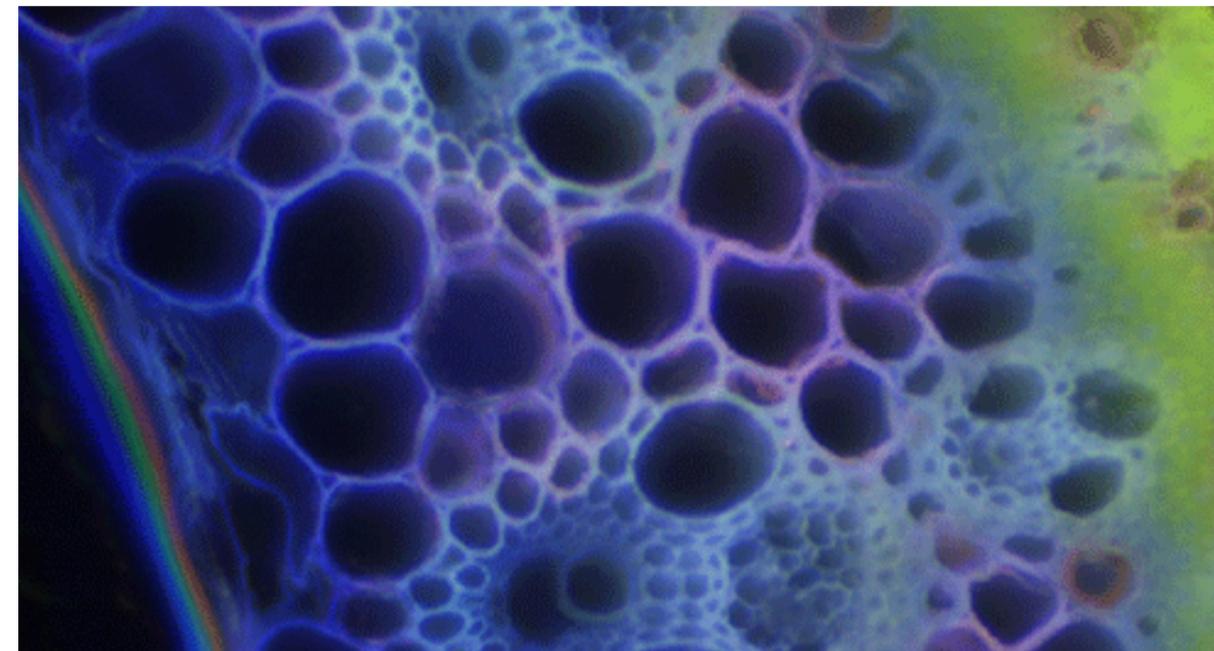
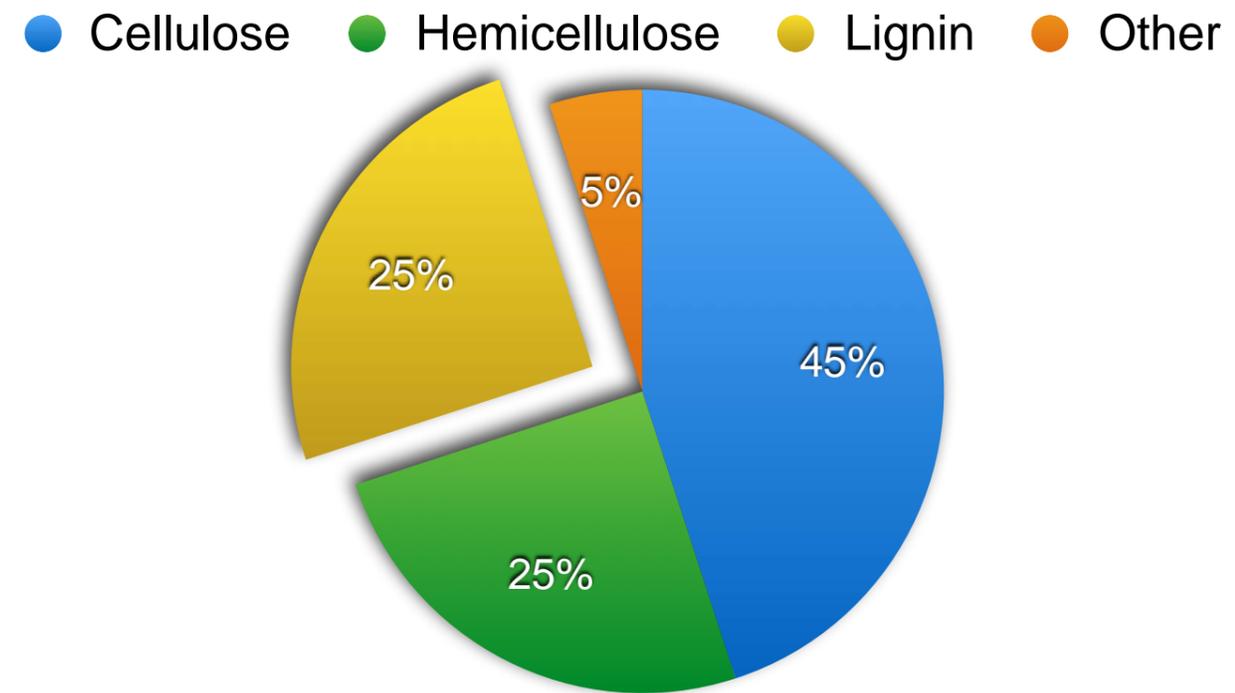
circular bio
circular materials

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

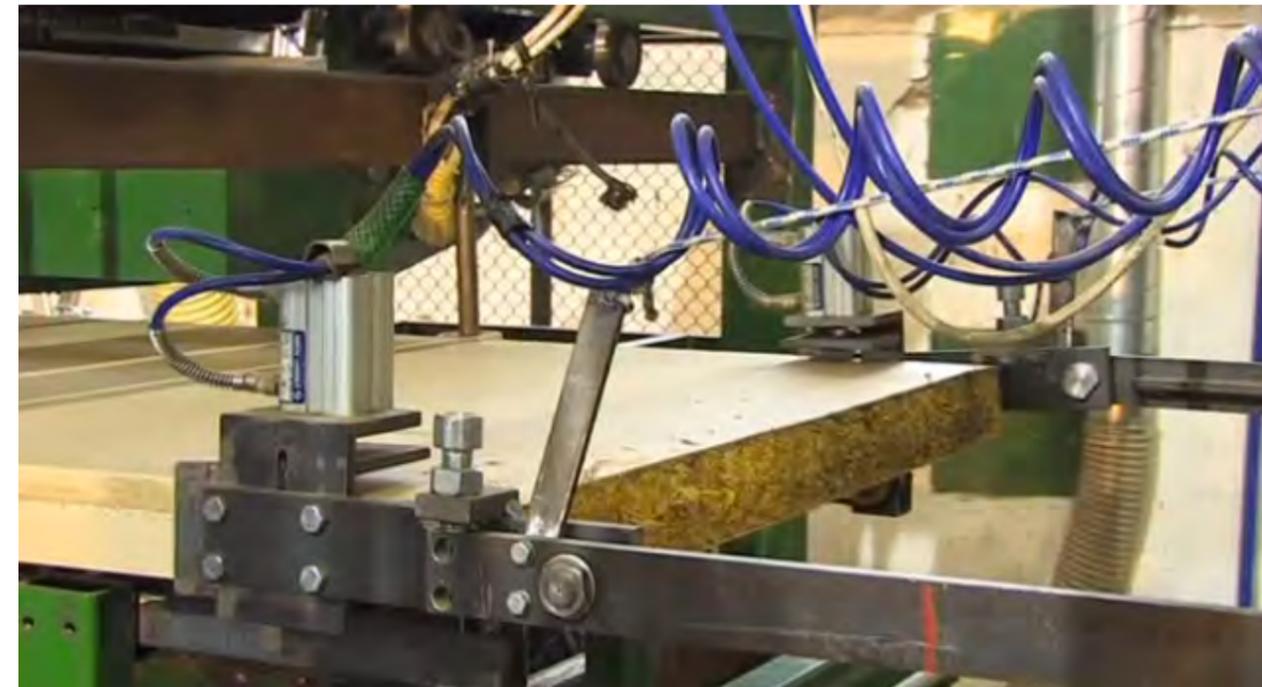
Steam liquifies lignin in cell walls

Lignin is a long chain molecule

Long chain molecules act as bonding agents

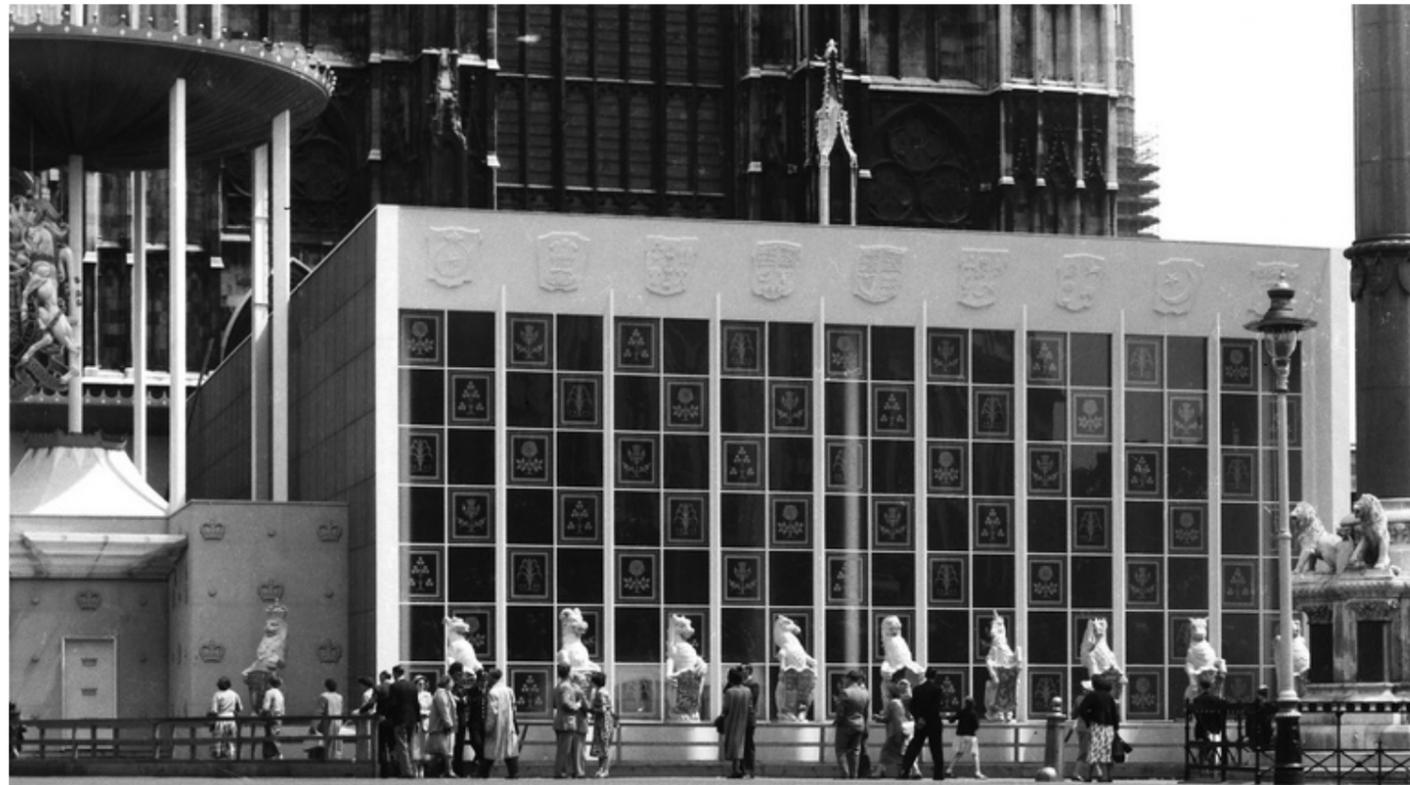
Pressure forces materials together into a self bonded whole

Straw can become load-bearing board materials





Original Strawboard Technology since 1945



The Advertiser
 Published by STRAMIT BOARDS LIMITED - CREEING ROAD - STOWMARKET - SUFFOLK
 SPECIAL ISSUE FOR THE "ROYAL SHOW," YORK, JULY 6th-9th, 1918.

What is STRAMIT?

STRAMIT is a building board manufactured from farm straw by a patented method. It possesses a structural strength that combines many of the qualities of wood-liner and is lighter, stronger, and more durable than wood-wool. Stramit provides a construction which is easily and rapidly suitable for repairs and extensions of existing buildings, and for new constructions. We shall be able to read elsewhere in this paper references to the uses of Stramit in this country and abroad. We trust that you will find this interesting, and be encouraged to try it. We shall be most glad to provide you with practical advice through your local merchant, who has ready stocks of Stramit. You are invited to write to the Sales Agents at the address on page 1, or direct to our office at Stowmarket.

BUILDING WITH STRAW

STRAMIT is new to this country, but it is no novelty. Straw as a building material was known to the Egyptians 5,000 years ago and straws have, incidentally, been found after this long period, that are perfectly preserved. In more recent times straw has been woven into mats for use in building, and Stramit is a further development of the "hatch-boards" that were in use some 25 years ago. The process of manufacturing a strawboard without pulping it and without holding it together with wires was perfected in Sweden, and world patents taken out in 1911. The British patent was granted in 1918, but due to the unsettled conditions immediately before and during the war, early development of Stramit was confined to Sweden and the Scandinavian countries. Now Stramit plants are working not only in Sweden, Great Britain, but also in Finland, Denmark, Holland, France, Egypt, Uruguay, Argentina, and installations are being completed in South Africa, Canada, etc. Manufacturing licences have also been granted for Belgium, Luxembourg, East Africa, West Africa, Palestine, India, Pakistan, China, etc. The world-wide acceptance of Stramit inspires confidence, and will further extend the already initiated international exchange of Stramit manufacturing and built-up material.



This is STRAMIT—a Machine-made wall

STRAMIT is Strong

The British Stramit factory dates from 1916 when premises were acquired in the centre of the East Anglian town area at Stowmarket. The extensive premises are on the main railway line between Ipswich and Norwich, and before the war were used for the storage of immense quantities of fertilisers. During the war years, they had to be used for the manufacture of fertilisers. Greatly increased the efforts of new development, but the local raw materials, but also wider agricultural and Fisheries and the Ministry of Agriculture and Fisheries, etc. The Government Department responsible for the production of Stramit is the Ministry of Works, Directorate of Building Materials, which have not only given their own support, but also acted as liaison with the Board of Trade, the Treasury, etc. These Government Departments and Trade Associations have had a common interest in seeing a greater utilisation of a native material, and the provision of a home-made building board that has not only been thoroughly tested and found good by scientists at home and abroad, but which has also been proved in practice to be a valuable building material. It is a product created to meet a wartime emergency, but it is a product that has won recognition in competition with timber and wood-fibre board, etc., which were freely available at a reasonable price in Sweden even during the war. Stramit is complementary to existing materials, and should be judged and used on its own merits.

STRAMIT COMES TO BRITAIN

The British Stramit factory dates from 1916 when premises were acquired in the centre of the East Anglian town area at Stowmarket. The extensive premises are on the main railway line between Ipswich and Norwich, and before the war were used for the storage of immense quantities of fertilisers. During the war years, they had to be used for the manufacture of fertilisers. Greatly increased the efforts of new development, but the local raw materials, but also wider agricultural and Fisheries and the Ministry of Agriculture and Fisheries, etc. The Government Department responsible for the production of Stramit is the Ministry of Works, Directorate of Building Materials, which have not only given their own support, but also acted as liaison with the Board of Trade, the Treasury, etc. These Government Departments and Trade Associations have had a common interest in seeing a greater utilisation of a native material, and the provision of a home-made building board that has not only been thoroughly tested and found good by scientists at home and abroad, but which has also been proved in practice to be a valuable building material. It is a product created to meet a wartime emergency, but it is a product that has won recognition in competition with timber and wood-fibre board, etc., which were freely available at a reasonable price in Sweden even during the war. Stramit is complementary to existing materials, and should be judged and used on its own merits.

Is STRAMIT Fireproof?

Fire Resistance. Heat and Cold Insulation. Stability.

A look at the above photograph will convince you of the remarkable fire resistance of Stramit. It is a remarkable fire resistance of about 1,000 deg. C. oxy-acetylene flame of about 1,000 deg. C. does not set light to the board. Ultimately the paper will burn and the straw char away, but very slowly. Immediately the flame is removed from the board, the fire goes out, as is indicated in the right-hand corner of the picture. It is a simple test, that you can carry out yourself! Official tests carried out have shown that a single thickness of Stramit board will stand up to the full heat of a conflagration (750 deg. C.) for an hour and only be destroyed to half its thickness.

Under the "spread-of-flame" test, which does not deal with combustibility but the surface quality of the material, untreated Stramit comes in Class III, if painted or distempred in Class II, and if plastered in Class I. This is better than for wood-fibre insulating boards.

The photograph also shows the immense heat-insulating properties of Stramit. Two-inch Stramit equals 24 inches of solid brickwork, which makes Stramit particularly valuable as an economical insulator of walls and ceilings, and for casing water tanks, etc.

You will also note from the photograph that the Stramit board is stable; it remains flat although it is unframed and the reced edges have been left unsealed for the test. Very little framing

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



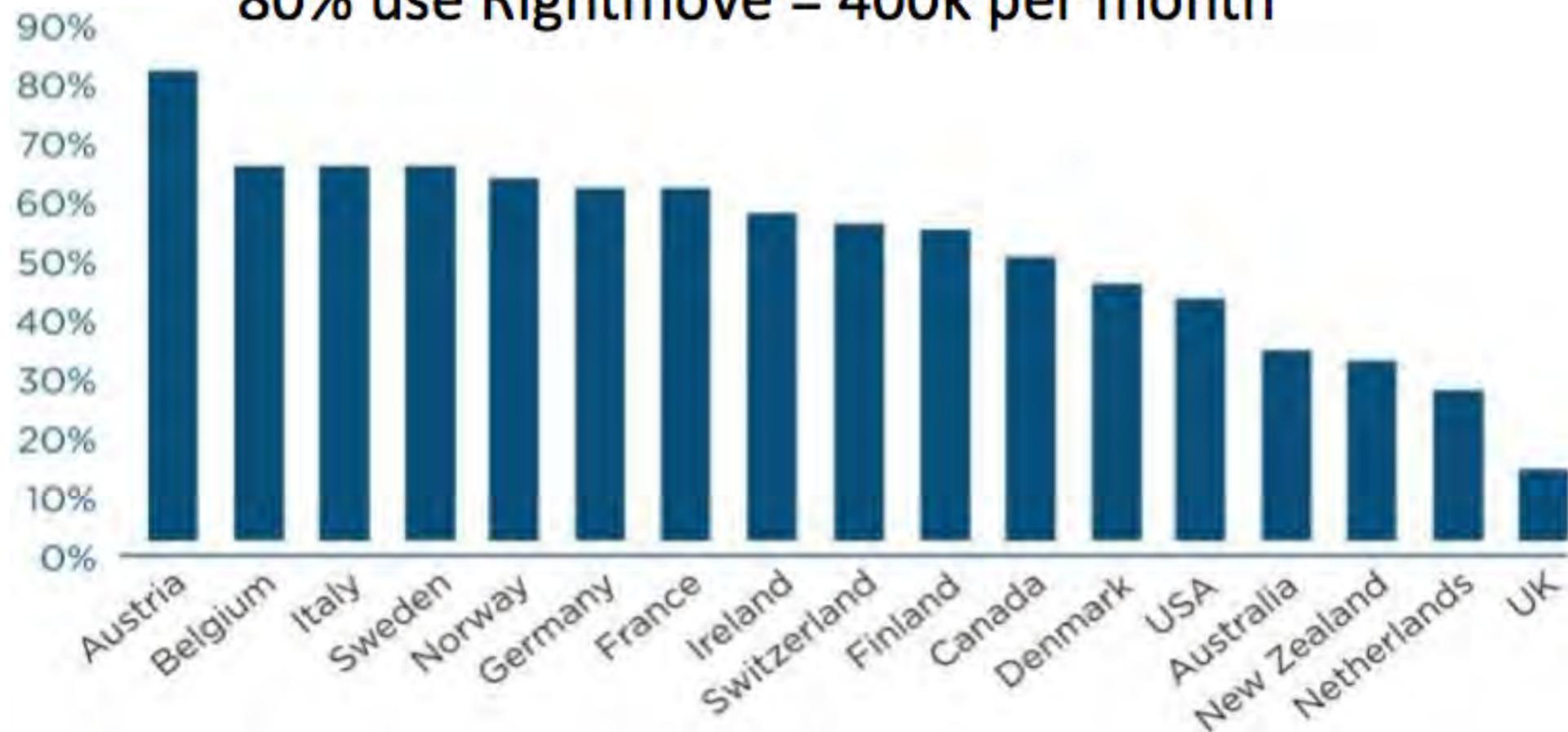
67% would not buy from a volume housebuilder

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



HoME Made

Custom Build

target to deliver 3,000 homes per year



Custom Build

Igloo Regeneration Custom Build - Trevenson Park Marketing has started



Detail planning secured 30 January 2015
Flying Factory in Devon
Passed Judicial review 22 March

Custom Build

Igloo Regeneration Custom Build - Trevenson Park Marketing has started



Custom Build

Igloo Regeneration Custom Build - Trevenson Park Marketing has started



Custom Build

3 and 2 storey options with pitched or terraced roofs

01 PLOT PARAMETERS

BCH shown in red



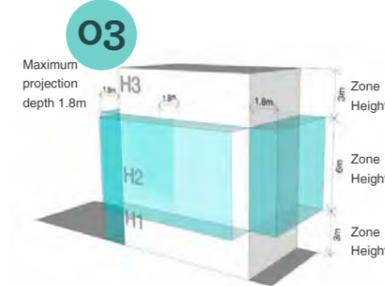
02 ADJOINING PROPERTIES

BCH provide temporary timber cladding



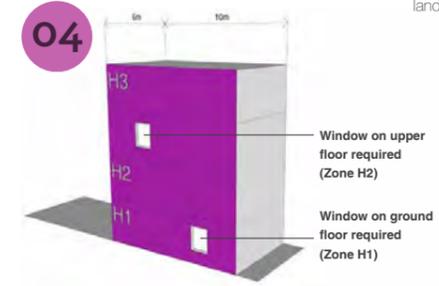
03 PROJECTIONS & RECESSES

BCH us limited recesses projections comply



04 CORNER LOCATIONS

BCH gables & corners comply



05 BOUNDARIES

BCH boundary treatments comply planting & hard landscaping



12 OTHER ITEMS

11 EXTERNAL COLOUR PALETTE

BCH Enclosed bin & Bike stores at rear

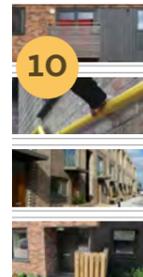
11 EXTERNAL COLOUR PALETTE

BCH uses a range of natural materials aluminium is mill finished



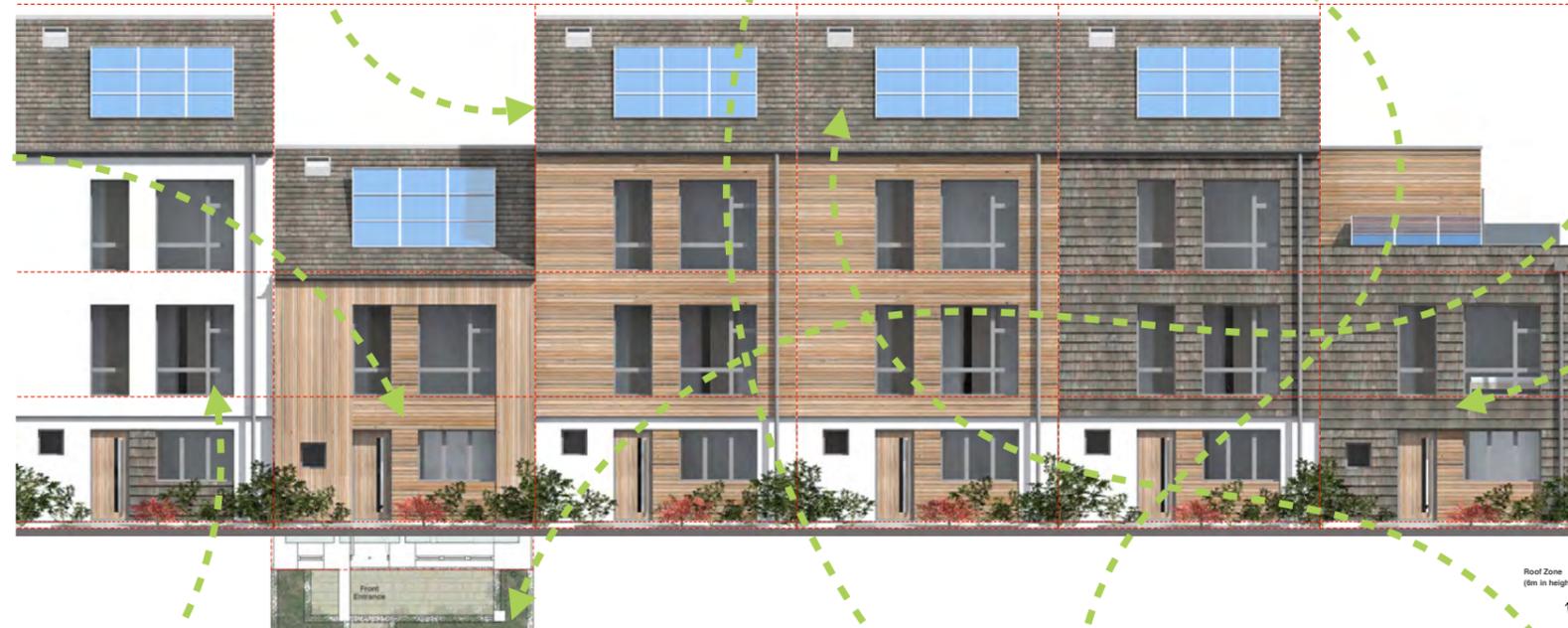
10 EXTERNAL BUILDING DETAIL

BCH Entrance canopies articulate facade



09 WINDOWS & DOORS

BCH Timber



06 PARKING

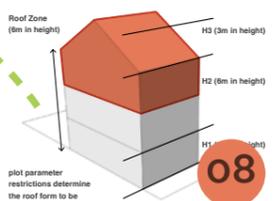
06 PARKING

Dealt with by master plan



07 EXTERNAL MATERIALS

BCH uses render, horizontal & vertical timber, shingles & slate tile hanging



08 ROOF MATERIALS

BCH uses slate, clay or cement fibre tiles

Design Code Compliance

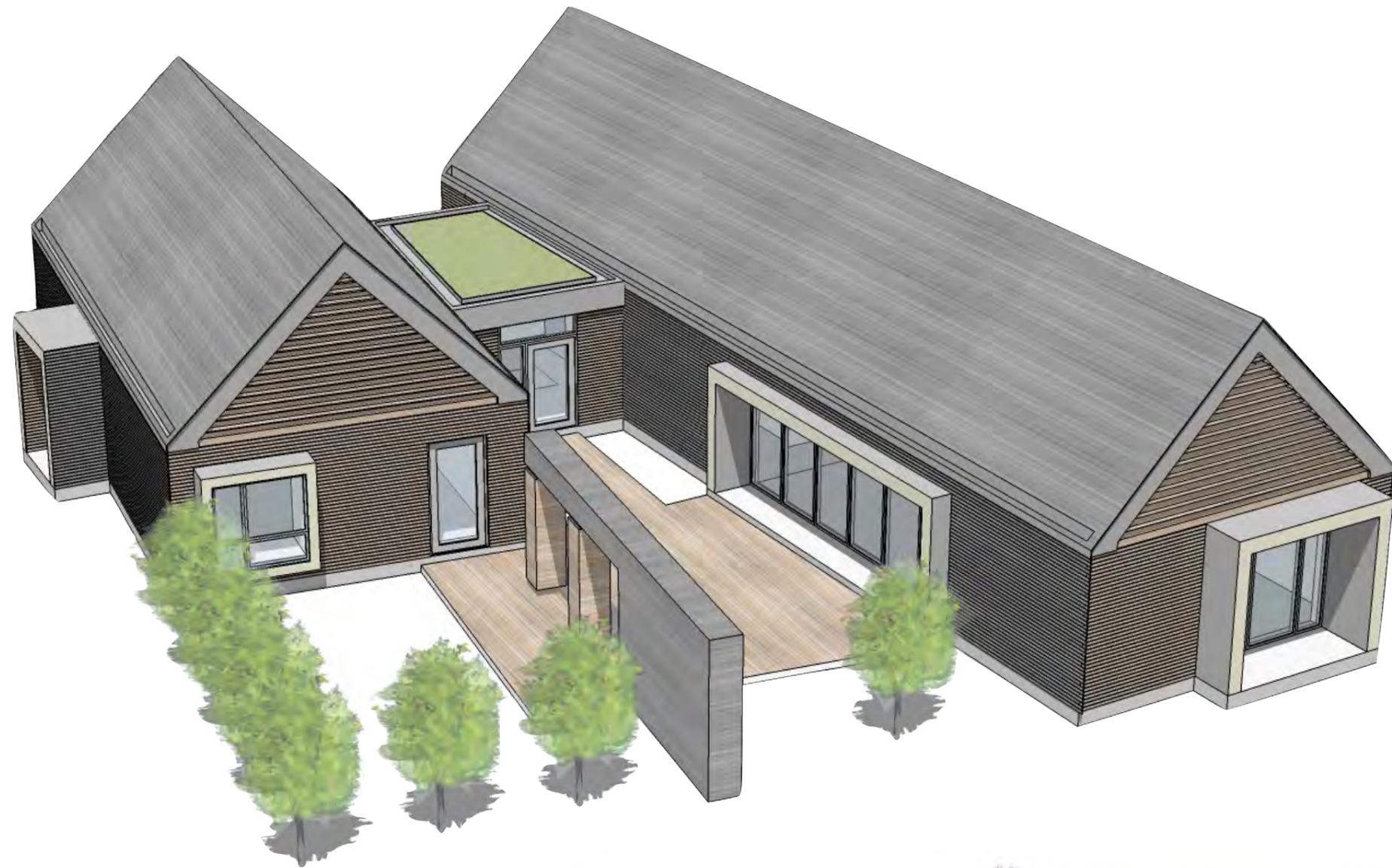




Custom Build

rear elevations









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

the sixth carbon sink - the built environment

balehaus[®] custom homes

BEAUTIFUL AFFORDABLE SUSTAINABLE

building homes
for
sustainable communities

