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INSULATION – IT'S MORE THAN JUST U-VALUES

THE MULTIPLE ROLES OF NATURAL FIBRE INSULATION

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Mark Lynn
Vice-Chair ASBP
MD Eden Renewable Innovations Ltd

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NATURAL FIBRE INSULATION IS PRODUCED FROM LOWER GRADE FIBRES OR LOW VALUE BY-PRODUCTS

LESS THAN 0.1% OF UK INSULATION MARKET COMPARED TO APPROX 6% IN GERMANY

UNTAPPED POTENTIAL

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NATURAL FIBRES

- Carbohydrates: Cellulose, Hemi-Cellulose, Lignin
- Proteins: α-Keratin, β-Keratin, Fibroin
- Energy of synthesis comes from the sun.
- All have a carbon backbone
- Insoluble, stable and strong
- Poor conductors of heat
- All can bind and release water at a molecular level

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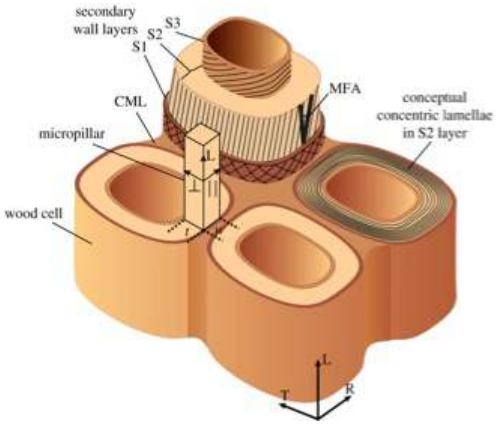
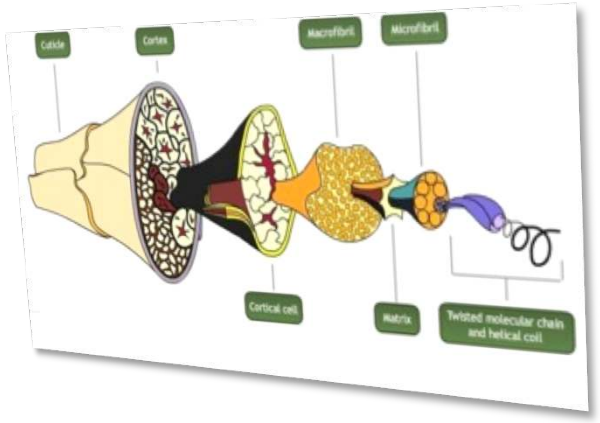
THE MICROSCOPE REVEALS THE COMPLEXITY OF NATURAL FIBRES



Wood



Wool

THIS COMPLEXITY HAS PURPOSE

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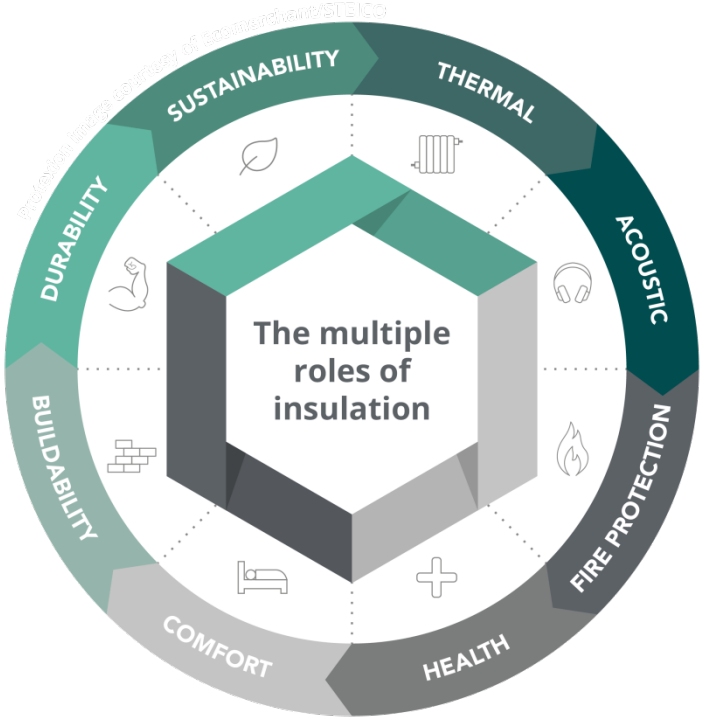
RECOGNISING VALUE COMES FROM UNDERSTANDING WHAT SOMETHING REALLY DOES



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THERMAL PERFORMANCE

Aim:

- Minimise heat loss – maximise energy efficiency
- Manage heat gain – prevent over-heating
- Regulate heat flux – provide most comfort

Achieved through:

- Lower thermal conductivity
- Higher density
- Greater specific heat capacity

NATURAL FIBRE INSULATION PROVIDES THESE

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ACOUSTIC PERFORMANCE

- The excellent acoustic performance of NFIs is down to their relatively high density and,
- Non-uniform size, shape, texture of the fibres helps the absorb sound across a wide range of frequencies.

50 mm Insulation Thickness	Practical Absorption Coefficients (BS EN ISO 354:2003)					
Product	**125 Hz**	**250 Hz**	**500 Hz**	**1 kHz**	**2 kHz**	**4 kHz**
32 kg/m³ Sheep's Wool	**0.20**	**0.55**	**0.85**	**0.90**	**1.00**	**1.00**
45 kg/m³ Rock Wool	**0.20**	**0.50**	**0.85**	**1.00**	**1.00**	**1.00**

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FIRE PROTECTION

Combustibility limited by:

- **Density**
- **Natural charring**
- **Use of mineral FR additives as appropriate**

NFI's pass fire tests to ensure they are fit for purpose. Tests include Euro Class fire ratings or British Standards such as BS476 or BS5803. Inorganic mineral based fire retardants are used where necessary.

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HEALTHY & COMFORTABLE INDOOR ENVIRONMENT

Insulation should support a comfortable, healthy internal environment:

- Thermal comfort (limit overheating, heat stability)
- Healthy indoor air (VOC's and airborne particulates)
- Moisture comfort (healthy humidity levels)
- Psychological wellbeing (biophillia)

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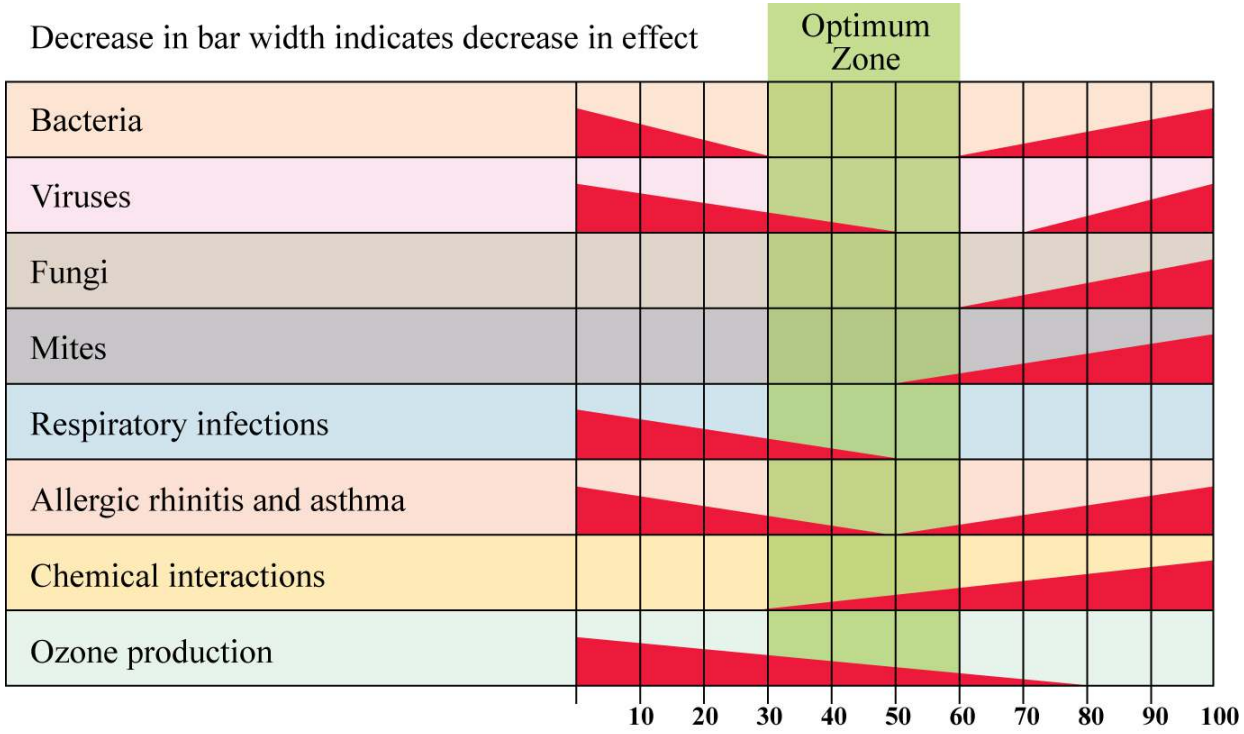
THE IMPORTANCE OF HEALTHY HUMIDITY



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BUILDABILITY & DURABILITY

- Structurally & chemically stable – performance doesn't diminish over time.
- Designed for ease of use.
- Relatively new innovation harnesses different approaches where insulation takes a high priority.
- Buildings designed around NFI's are less prone to damaging effects of harmful moisture.

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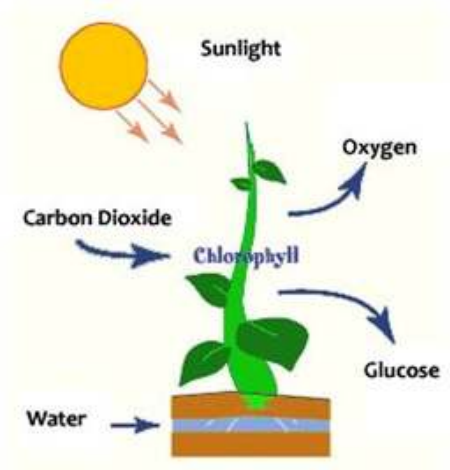
SUSTAINABILITY

- Raw material sustainability (abundant/continuously renewable)
- Healthy (in both production and use)
- Low embodied carbon
- Greater end of-life options
- Transparency



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THANK YOU

ANY QUESTIONS?

Find out more at www.asbp.org.uk

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