

bre

Why aren't we all building out of natural fibres?

- some thoughts on potential technological and social barriers

Presentation to
Natural Fibres in Construction
- innovative applications and processes

Tim Yates, Building Research Establishment
17th November 2009

Sustainable construction

- Sustainable buildings
- Sustainable refurbishment
- Sustainable materials
- Materials for sustainable refurbishment

- Use of sustainable and low-environmental impact materials in refurbishment projects
 - Ongoing BRE Trust project
 - started April 2008
 - due to complete November 2009

Materials for sustainable refurbishment

The project objectives:

- To assess available resources and market potential of traditional and innovative materials in refurbishment;
- To define materials/composites in such a way that they can be incorporated into BRE's environmental profiling methodology and classifications;
- To produce sourcing guidance and tools for use by a range of stakeholders;
- To disseminate results to the construction industry via existing networks
- To identify further opportunities for BRE/BRE CICM in this field and strengthen our position in sustainable trends in construction for the 21st century.

Materials for sustainable construction

Materials used for new build and refurbishment can be considered under four headings:

- Traditional materials used in traditional ways (*for example solid timber for floors and windows*)
- Traditional materials used in innovative ways (*for example 'glulam beams'*)
- Natural crops and fibres used as replacements/alternatives (*for example straw bales for walls*)
- Innovative materials (*for example modern fibres composites with natural fibres*)

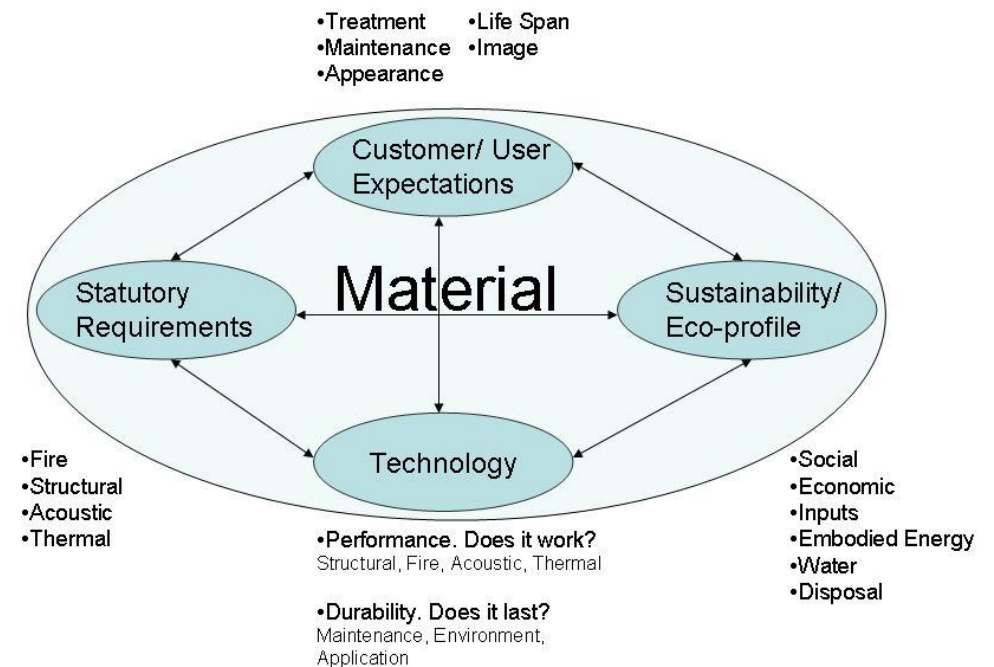
Materials for sustainable construction

- *So why don't we use them?*

What are the barriers to a greater uptake?

What are the potential drivers to greater uptake?

- *Social ?*
- *Environmental ?*
- *Economic ?*



General Barriers to Sustainable and Innovative Materials and Methods

- Market Barriers
 - ‘Lock-in’
 - Supply
 - Risk Barrier
 - Psychological Barrier
 - Knowledge
 - Change
 - Prestige Materials and Social Status
- Product Information Quality
 - Information Source, Availability and Presentation
 - Durability
 - Meeting Building Regulations and Standards

Requirements for Increased Use of Sustainable Materials in Refurbishment

- Building Regulations and Building Products
 - Building Regulations
 - Innovative Materials and Methods
 - Change of Philosophy
 - *Performance Specification*
 - *Expanding the Scope*
 - *Completion Evidence of Performance*

Requirements for Increased Use of Sustainable Materials in Refurbishment

- Product Assessment
 - Technical Assessment and Development
 - *Criteria*
 - *Meeting the Criteria*
 - *Assessing Durability*
 - *Presentation of Information*
 - Specification and Installation
 - *The Trades*
 - *The Professions*
 - *Role of Building Control*
- Sustainability Assessment
 - Standardised Assessment Tools
 - Assessment Tool Development

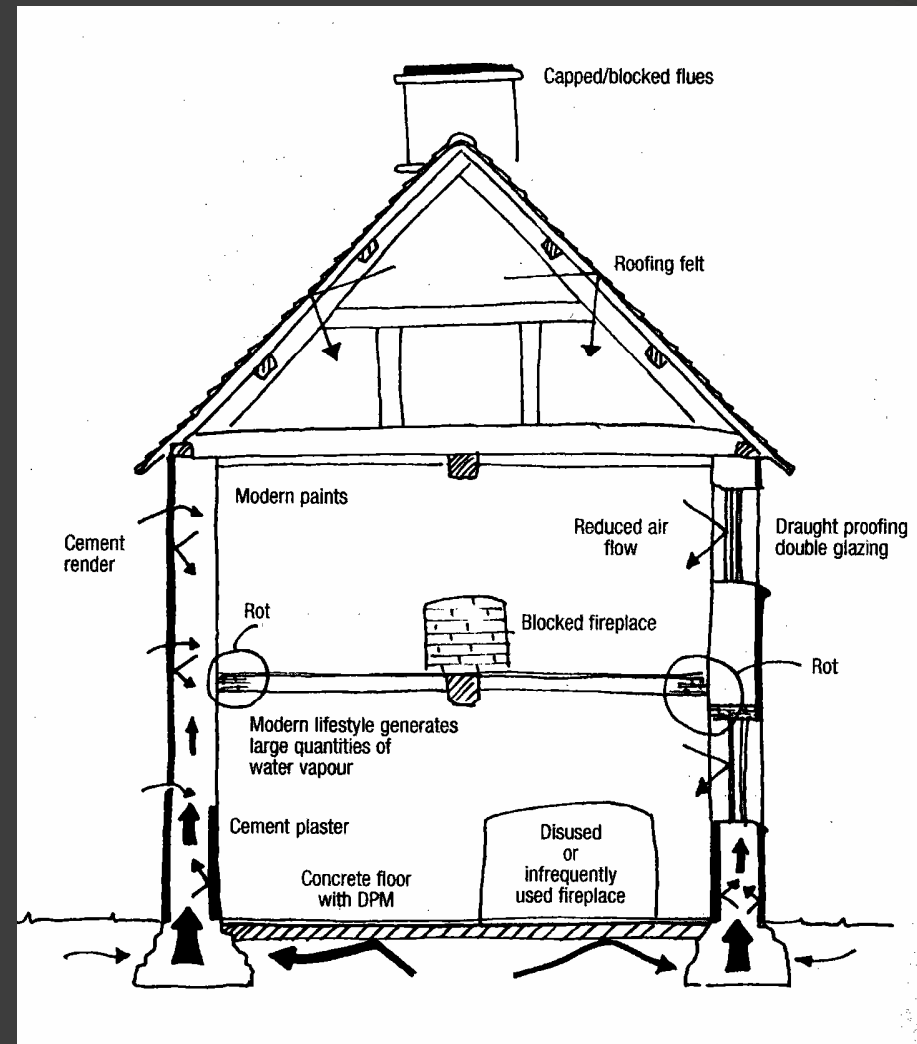
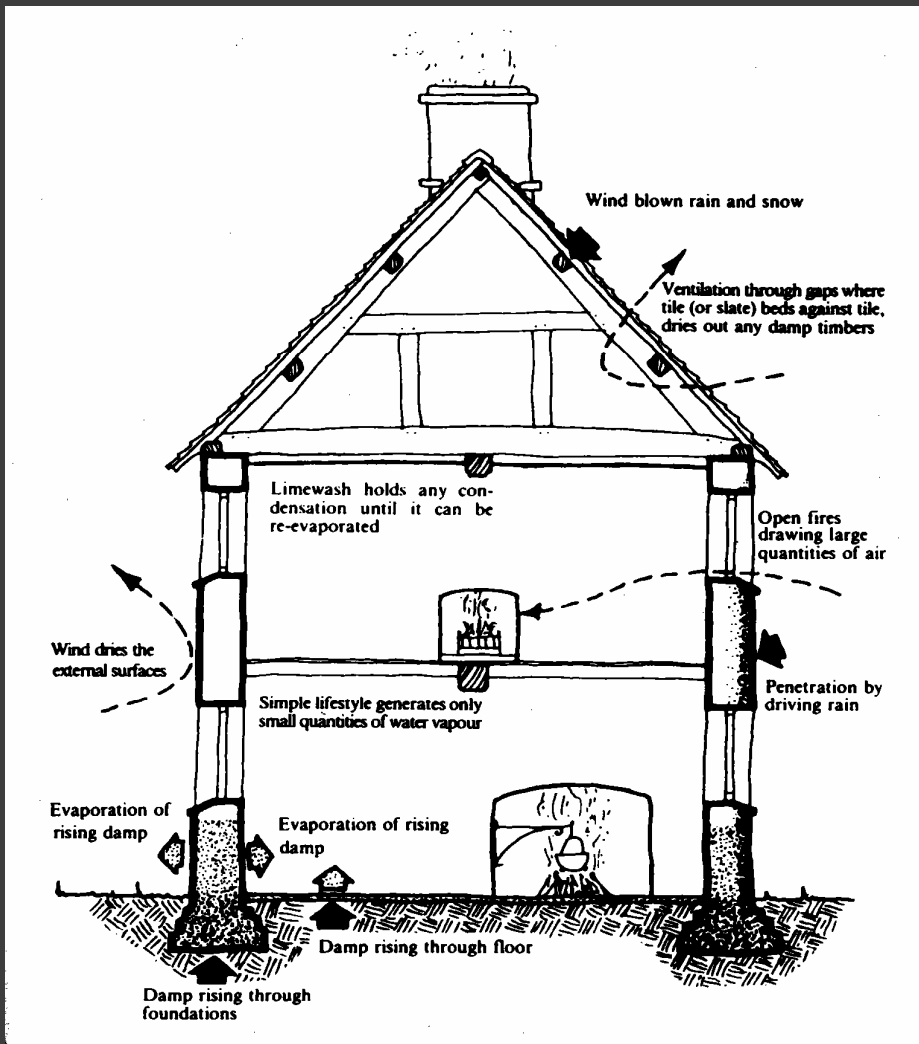
Materials for sustainable construction

Five particular questions are raised:

- Compatibility with the existing building and its fabric
- Environmental impact of the material ('cradle to grave')
- Expected performance / benefits
- Availability
- Whole life costs/ service life.

Existing building and fabric

[Images from Oxley 2003 and SPAB]



Environmental impact of the material

- ('cradle to grave')

- Embodied energy
- Carbon sequestration
- Environmental impact
 - Production
 - In use
 - End of life



Expected performance / benefits

- Structural
- Thermal
- Acoustic



Availability

- Limited resources
- Waste material
- Scope for increased production/supply
- Carbon miles



Whole life costs/ service life

- Repairs and maintenance
- Durability
- Expected life time
- Costs
 - Economic
 - Environmental
 - Social



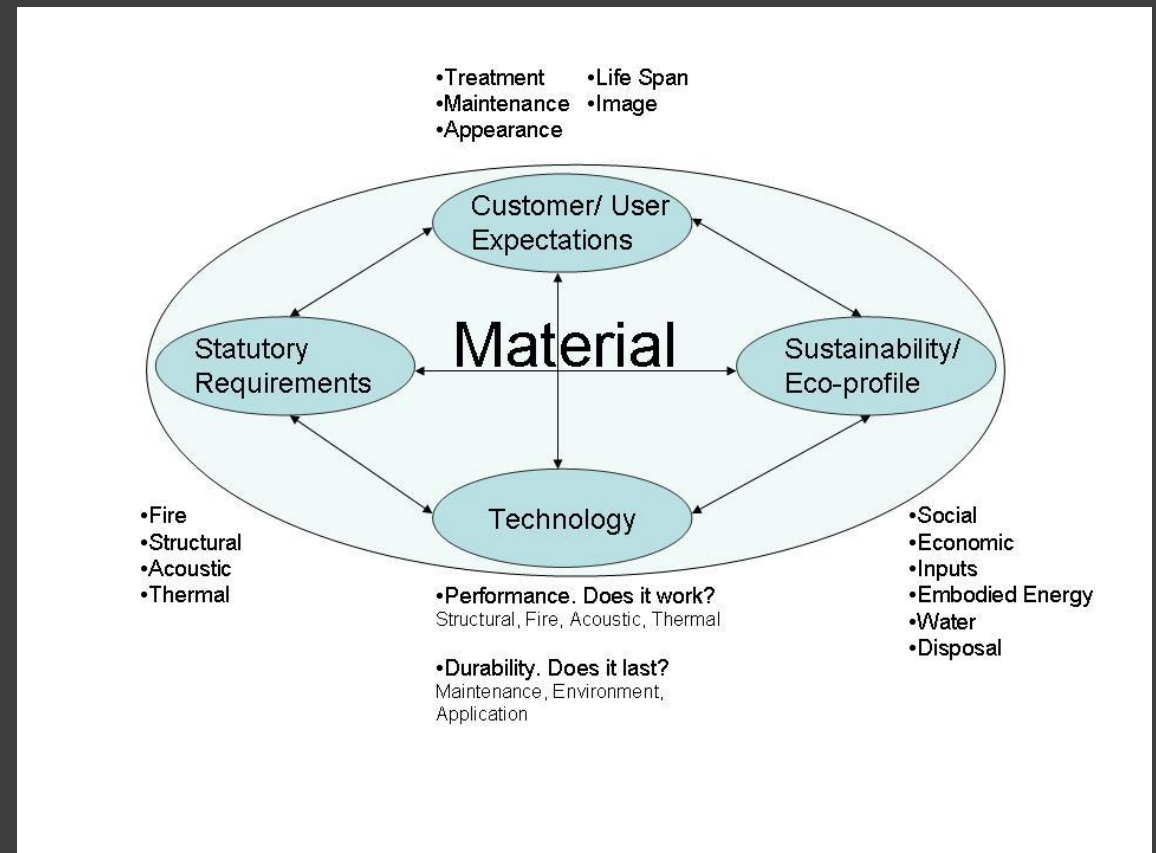
Materials for sustainable construction

- *So why don't we use them?*

What are the barriers to a greater uptake?

What are the potential drivers to greater uptake?

- *Social ?*
- *Environmental ?*
- *Economic ?*



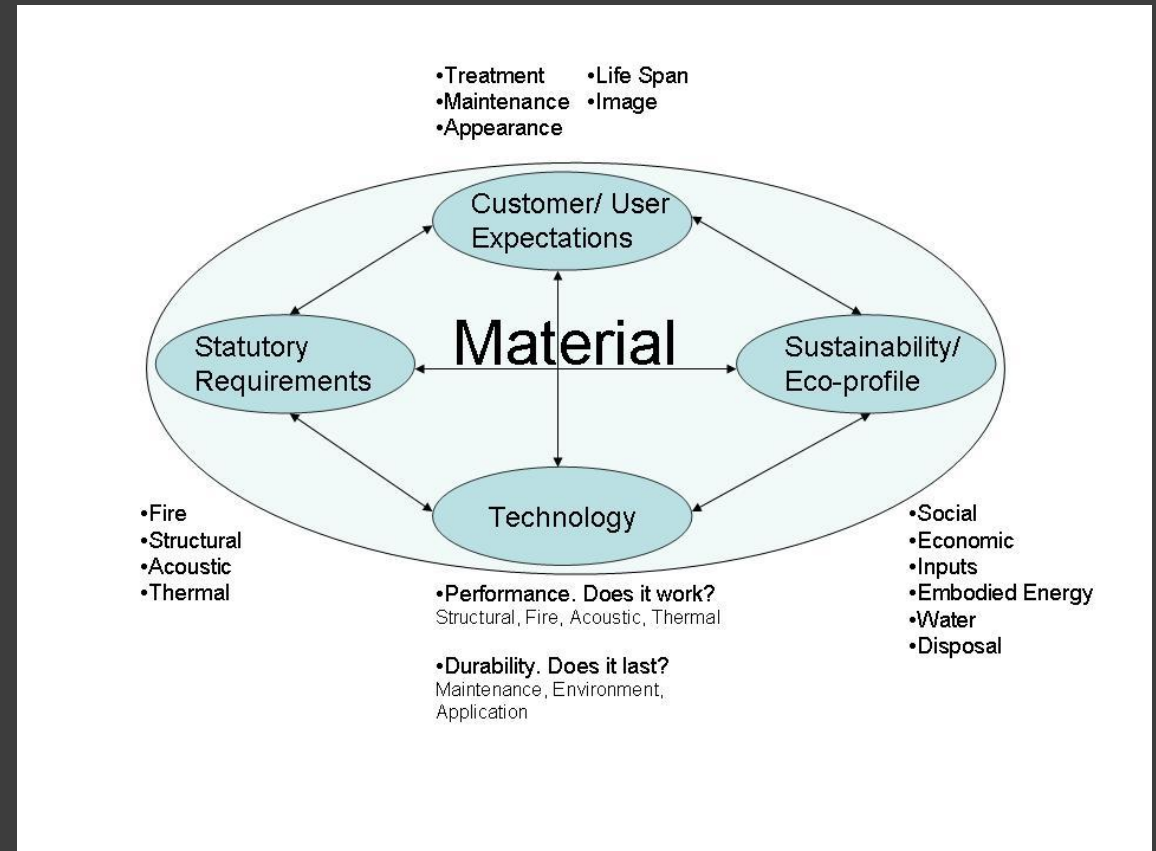
Materials for sustainable construction

- *So why don't we use them?*

What are the barriers to a greater uptake?

What are the potential drivers to greater uptake?

- **Social ?**
 - Psychological ?
 - Status ?
 - Why should I ?
- **Environmental ?**
 - Assessment methods ?
 - Common understanding?
- **Economic ?**
 - Market ?
 - Regulations ?





Thank you for your attention