

## BIOFA UK

### PRESENTATION PLAN

1. Key facts and priorities
2. Sustainable materials: pros and cons
3. Specifying natural alternative. **Example Bamboo**
4. Sustainable interior benefits. **Example natural paints**
5. Energy, efficiency, recycling. **Example community wood recycling project**
6. Why bother? Cost versus added value

## BIOFA UK

### 1. Key facts

Sustainable building involves taking into account the following key considerations:

- Energy Efficiency
- Material Choice and Use
- Site Impact
- Water use and Efficiency
- Longevity and Flexibility

In the context of climate change:

- 90% of a typical building's energy is used in its operation through its life
- Only 10% in the energy of its construction




Looking at materials is important – limited resources, personal health etc – but only if correct strategy for reducing CO2 emissions is also adopted first.

## BIOFA UK

### Priorities

Acting locally is important but ultimately meaningless in stopping impending catastrophic climate change unless global politics also changes.

1. Use public transport wherever possible (avoid flying when possible) Big Lemon buses
2. Turn every electrical appliance off completely when not in use
3. Ensure you use a legitimate sustainable energy provider such as Ecotricity & Good Energy
4. Improve the thermal performance of your house/office.
5. Use ecologically sustainable design in new build, refurbishment and re-decoration

## Sustainable materials: pros and cons

### material: concrete



Concrete superficially seems the antithesis of an eco-friendly material, but I promote it at every opportunity. Why?

Negatives:

- an image problem from post war utilitarian buildings
- one ingredient – portland cement – releases significant amounts of CO2 into the atmosphere
- Gravel extraction can damage natural habitats
- Formwork is generally discarded after use

Positives:

- It can be used very effectively to create high thermal mass in energy efficiency strategies for buildings
- It is naturally moisture and insect resistant and requires little maintenance
- It can be the final finish not requiring a finish which may not be environmentally friendly
- The ingredients are plentiful – sand, gravel and portland cement – and 25 to 60% of the latter can be replaced by fly ash

## Sustainable materials: pros and cons

### materials: glass




If there is one material that should be promoted more than concrete, it is glass.

Negatives:

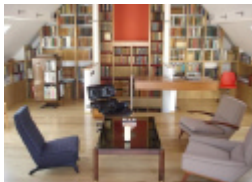
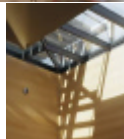
- It entails melting the ingredients at high temperatures consuming huge amounts of energy

Positives:

- It is indispensable in all but the hottest driest climates
- Its planned use is crucial to the energy efficiency of our buildings
- Quality of light is intimately bound up with our sense of emotional and physical well-being
- The basis ingredients – sand, soda and lime – are abundant
- It can be re-cycled with no loss of quality

## Sustainable materials: pros and cons

### materials: wood

Positives:

- A renewable living source that naturally reduces levels of carbon dioxide in the atmosphere.
- It has low embodied energy
- Lends itself to recycling
- Trees are renewable\*

Negatives:

- \*Ancient Forests are not renewable
- \*Single species plantations of softwood discourage biodiversity and are more prone to disease
- Many species are endangered
- Timber treatments generally chemically based

Green Guide:

- Make sure the product is bought from an approved sustainably managed plantation. Look for the symbol of the International Forestry Stewardship Council or similar
- Avoid old-growth timber or wood from endangered species
- Look to minimise the distance the timber has to travel
- Use salvaged or reclaimed wood wherever possible
- Choose formaldehyde-free plywood and MDF
- Detail out timber treatments or choose ones that are as harmless as possible.

Sustainable materials: pros and cons

**materials: natural fabrics and weaves**



Safi furnishings introduce comfort, warmth and facility. The natural fibres come from readily available and renewable sources and biodegradable and recyclable.

Fibres include: cotton – linen – wool – silk – reeds and rattan – sisal – seagrass – jute – hemp – rayon

**Green Guide**

- Check labels carefully to determine fabric is wholly natural
- Avoid fabrics or weaves chemically treated to improve wear
- Buy organic unbleached cotton or linen
- Use natural underlays for carpet and/or natural fiber floorings

**BIOFA UK**

**3. Alternative sustainable materials**



**Paper:** recycled paper is used in most wallpapers (using perhaps starch-based pastes rather than the normal by product of the chlorine industry).

**Cork:** a natural material that makes resilient floor or wall surface.

**Linoleum:** a natural easy-care hygienic alternative flooring to vinyl.

**Rubber:** the re-cycling of car tyres gives a resilient slip-resistant and weather-resistant floor. Although low levels, rubber surfaces have VOC emissions.


**Terrazzo:** a terrazzo look alike made from recycled glass and non-toxic resins.

**Bamboo:** an alternative to wood for flooring, panelling, stairs, countertops.

**BIOFA UK**

**BAMBOO**

- The material
- Properties
- Price



**BIOFA UK**

**1. MATERIAL:**

Bamboo is a woody perennial plant.

A symbol of righteousness and resilience, some of its species will grow from one to three feet a day. It is a traditional material providing food as well as construction material. It reduces our consumption demand from the rainforest. Its hardness, strength and stability are its most remarkable qualities.

**BIOFA UK**

**STRENGTH**

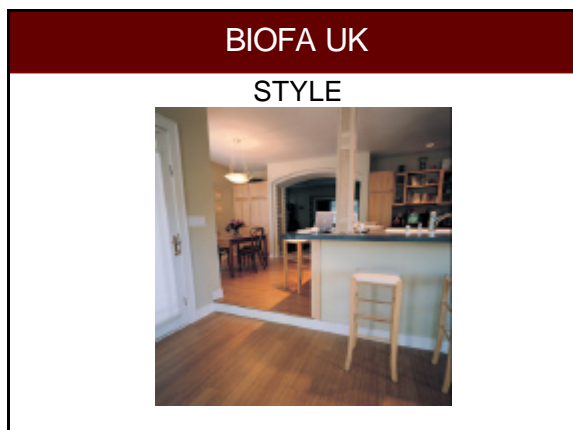


**BIOFA UK**

**2. PROPERTIES:**

The bamboo as a plant is probably the fastest way to re-green an area.

Due to its foliage it will produce more oxygen than trees in the same amount of time. Its fibres are tight, giving this material its strength. It is a stable and hard material, ideal for flooring. It is less likely to crack or create gaps due to expansion & contraction problems associated with temperature & humidity changes. It is harvested every five years as opposed to every fifteen to twenty for timber. It is a traditional product that has found its way into contemporary society through its strength and its style.



**BIOFA UK**

When looking for a bamboo flooring, staircase, or furniture, make sure to Consider whether the product is treated with natural wood treatment, oils and varnishes. Indeed there is no point using a natural bamboo floor, if it is bathed in a chemical soup, and covered with plastic. The natural oils and varnishes used to treat your floor can be a sustainable system working in harmony with your interior. They also provide you with a healthy environment.

The price of a bamboo flooring system averages between

**£14.95/m<sup>2</sup>    £24.95/m<sup>2</sup>**

**BIOFA UK**

**4. sustainable interiors: benefits**

Taking a sustainable approach can bring clear business benefits to building occupiers:

- **improved environment** - office refurbishments can increase productivity levels by up to 20 % for minor works and 70% for major restructuring (Franklin & Andrews, building economists)
- **increased flexibility** - poor office layouts have been estimated to decrease productivity by 10%- 20% (Franklin & Andrews)
- **reduced operating costs** - business annually pays £1 bn in Climate Change Levies (DTI)

**BIOFA UK**

**NATURAL PAINTS:**

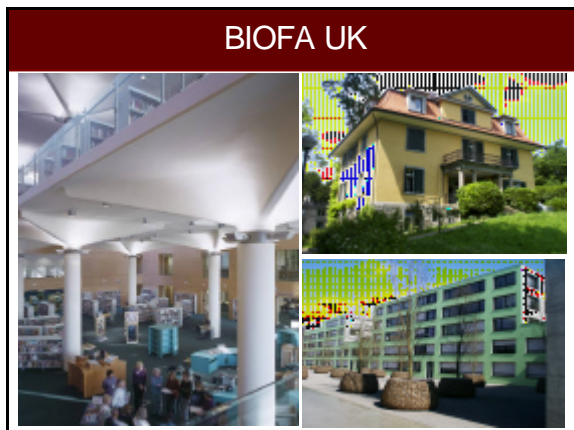
- The material
- Properties
- Price

**BIOFA UK**

The material.

Ingredients Water, chalk, titanium dioxide, aluminium oxide, talcum, linseed oil, diatomaceous earth, clay, lavender oil, cedar oil, ylang-ylang oil, turkey red oil, borax, casein, orange oil.

These ingredients are mixed together with a minimum impact on the environment to produce a professional yet environmentally friendly coating. It is increasingly popular due to its efficiency and its pleasant aspect. Outdoors or indoors the natural paints are a sustainable, and healthy alternatives to petrochemical by products.



**BIOFA UK**

Properties.

fundamental properties of natural paints they are mineral based paint

- They are water based and solvent free (VOC free).
- They do not physically stick to the base creating a film...
- ...They cristalise with the base, its is an osmosis with the wall.
- They are micro-porous and allow breathability.
- No static electricity therefore less particules in the air.
- Will not alter the U value of your surface.

**BIOFA UK**

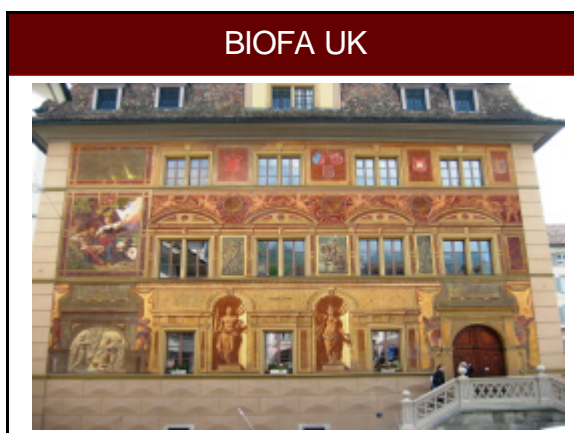
A natural paint is microporous it will allow the walls to breath. It acts like a skin on the walls. It increases breathability of your surfaces and provides a cleaner air indoors.As opposed to a chemical based paint which will create a film on your surface trapping any moisture inside.

Natural Mineral silicate paint

Chemical based paint

**BIOFA UK**

Historically on listed buildings, all the coatings were mineral based, chalk, lime, silicate. Applied in thick layers they would absorb humidity, and reduce the condensation problems, fungus, and other mold issues. These are extremely important factors to consider in the search for clean air, when dealing with schools and hospitals. Remember 90% of your life is spent in a building. Considering the percentage of asthma and eczema sufferers in the UK only, it is paramount to make our home a safe environment. And to look after these homes like a third skin to our lives.



**BIOFA UK**

Prices:

A litre of natural emulsion averages between  
 £6.64/ litre to £9.00/litre across natural brands

Farrow and ball is £8.39/litre

One litre covers on average 10m<sup>2</sup>

"BECAUSE THE EARTH IS NOT A PRESENT FROM OUR PARENTS BUT A LOAN FROM OUR CHILDREN."

## BIOFA UK

### 5. energy efficiency

This is absolutely key to eco design in both existing and new buildings:

- **Insulation** – the best value for money energy efficiency tool: but most efficient materials are synthetic, whose production is environmentally damaging and linked to health risks. Try cellulose, wood fibreboard, sheep wool and flax
- **Weatherproofing**
- **Use energy efficiency appliances and lighting**
- **Use renewables:** solar thermal, photovoltaics, wind power, biomass
- **Where possible use passive solar strategies and thermal mass**
  - Concrete
  - Stone/brick
  - Limecrete
  - rammed earth
- **Where possible consider ground source heat pumps**

## BIOFA UK

### recycling

Also known as adaptive re-use, fundamentally refurbishment and renovation of buildings is the most significant form recycling, saving the energy and materials expended in building new.

Designers could help by specifying materials with a large recycled component. In addition, we must consider to:

- **Recycle Materials** from demolition and refurbishment
- **Use recycled materials** in building, some previously mentioned
- **Recycle consumer waste**

In addition to recycling, there are three other R's that apply to all aspects of energy and resources:

- **Reduce**
- **Re-use**
- **Recover**

## BIOFA UK

### COMMUNITY WOOD RECYCLING PROJECT:

- Material
- Properties
- Price

## BIOFA UK

**Material:**

Collecting from building sites, public sources, the Wood Recycling Project has reduced the amount of timber sent to landfill by 4000 tones a year.

The Brighton Wood Recycling Project helped recycle 630 tones of wood in 2006. From floor boards to fire places, shelves, furniture, the wealth of this recycling scheme has also created employment in the community.

## BIOFA UK

**Properties:** Flooring for example

The wood collected and resold to general public, is already seasoned. It will not crack and move as much as new flooring system. The character will add value to your property far more than newly fitted timber. It is a smart way of, recycling some valuable material and turning it into an asset .

Once again when treating these floor boards or other wood appliances make sure to favour natural wood treatment oils and varnishes. The use of chemicals Products would defy the object.



## BIOFA UK

Price:

The use of floor boards from the community wood recycling project

Varies between £18.00/m<sup>2</sup> to £27.00/m<sup>2</sup>


## BIOFA UK

### Why Bother? Cost Versus Added Value

Eco design until now has been altruistic – investing in a future for future generations.  
Capital costs are almost certainly higher, but produce a more durable building

What are the benefits?

- Lower energy costs, in fact the building can become a net earner
- Improved personal health
- A sense of well-being and comfort
- Compliance with Eco-homes BRE Ratings
- Added 3% value to your property.




There are less tangible benefits:

- Eco buildings normally score highly in aesthetic terms
- Increasingly eco design equates to best practice

In the future a building or material/product that fails on ecological grounds will be no more acceptable than failing on structural or ergonomic grounds.


## BIOFA UK



In terms of climate change, material selection is a relatively low priority.

Other issues:

- Durability: the longer the element lasts the lower its environmental impact
- Sustainability of natural resources
- Impact on natural habitats
- Impact on human health
- Embodied energy
- Levels of waste
- The three Rs – recycle, repair and re-use
- Cost



## BIOFA UK

### materials: embodied energy

This is difficult to measure effectively:

- Energy of extraction of raw material
- Transportation to the factory
- Energy in processing
- Transportation to site
- Energy in construction

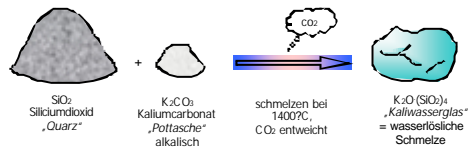



## BIOFA UK



## BIOFA UK

### Production des silicates à partir de la fusion




$\text{SiO}_2$  Siliciumdioxid „Quarz“ +  $\text{K}_2\text{CO}_3$  Kaliumcarbonat „Pottasche“ alkalisch

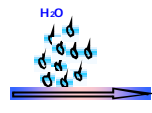
schmelzen bei 1400°C,  $\text{CO}_2$  entweicht

$\text{K}_2\text{O}(\text{SiO}_2)_x$  „Kalwasserglas“ = wasserlösliche Schmelze

### BIOFA UK




$K_2O(SiO_2)_x$   
„Kalhwasserglas“  
= wasserlösliche  
Schmelze  
  
Silicate de  
potasse




$H_2O$


Festes Wasserglas wird bei  
ca. 200°C unter Druck in  
Wasser gelöst. Es entsteht  
eine flüssige  
Kalhwasserglaslösung.



### BIOFA UK




+



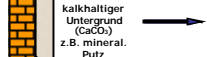
Luftkohlen-  
säure

+



Mineralische  
Pigmente

+



kalkhaltiger  
Untergrund  
( $Ca(OH)_2$ )  
z.B. mineral.  
Putz

### BIOFA UK

SPECIFYING NATURAL ALTERNATIVES  
REFURBISHING INTERIOR WITH SUSTAINABLE ALTERNATIVES

- A. BAMBOO FLOORING
  - The material
  - Properties
  - Price comparison
- B. NATURAL SILICATE PAINTS
  - The material
  - Properties
  - Price comparison
- C. WOOD RECYCLING PROJECTS
  - The material
  - Properties
  - Price comparison
- D. Many others.