

Sustainable Benchmarks?

- A crucial issue is how to decide what is sustainable or green
- There is too much “Greenwash” around
- Doing *a little bit* isn’t enough
- Why should our construction industry be allowed to waste so many resources?
- What are the alternatives?

Sustainability is an over-used word

- Too many buildings and building products are now being promoted as sustainable purely as a marketing device
- Just because something helps to save some energy, is affordable and may last doesn't mean it is saving the planet.

The Reality of “sustainability”

- Most buildings which achieve good levels of energy efficiency achieve this using fossil fuel based insulation products which are fire hazards, give off toxic fumes, are health hazards, cannot bio-degrade when land-filled and pollute the atmosphere during manufacture
- Most modern prefabricated buildings rely on glues, sealants and membranes which are synthetic, toxic, pollute the environment and make disassembly almost impossible
- Most materials used in construction are non renewable, leave behind holes in the ground and cannot be easily recycled
- Some forms of renewable energy like PVs take a hundred years to pay back the environmental costs of producing them.

Global Responsibility

- We consume ten times our fair share of global resources
- We will need ten planets to sustain our current use of resources
- The Construction Industry Consumes 10% of all our energy usage
- Buildings and their production contributes over 50% of our CO₂ emissions
- We waste up to 40% of materials coming onto site
- Construction waste is one of the main contributors to landfill
- We have enough empty buildings to meet all our new building needs for at least a decade
- We still have tens of thousands of people living in sub standard houses or are on the streets

Working with what we've got

- New build is only 3% of stock
- Too much eco design focussed on new build
- Importance of eco renovation/conversion
- Re-using existing built resources if done properly is more sustainable than new build

The embodied energy debate

- Energy in use more important than embodied?
- But if low/zero energy buildings achieved then embodied energy much more significant
- Buildings are altered every ten years thus bumping up embodied energy
- End of life/disposal issue

Many demonstration buildings are off message

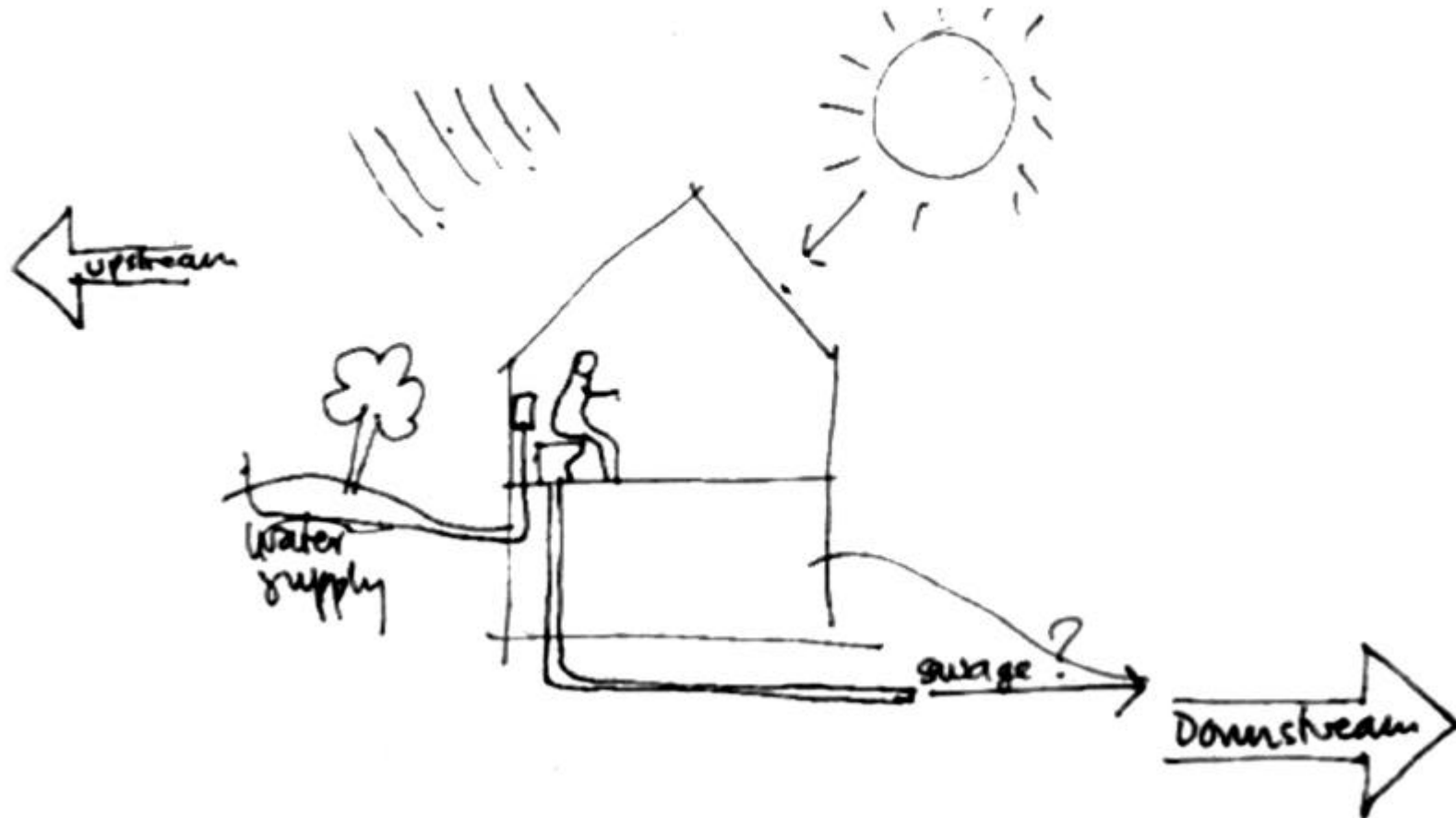
- “Ecos”
- No use of passive solar
- Heavy high embodied energy materials with misunderstanding of thermal mass
- Renewables which only meet 75% of energy needs
- Building in the wrong place, not accessible by public transport
- No community involvement

Dubious Claims

- **Gaia Energy Centre**
- Water wheel that needs electricity to run
- Little use of passive solar principles
- Little use of renewable materials
- Cost before environment
- High embodied energy materials

Upstream and Downstream

The importance of an holistic approach



Tom Woolley, Centre for Green Building Research, Queen's University Belfast

How do we benchmark sustainable buildings?

- Are zero impact buildings possible?
- All buildings use some resources
- Do we need to use as much as we normally do?
- Many existing assessment systems are fundamentally based on existing practice, not on an achievable ideal

What do we need to do to get near a zero impact building?

- Use renewable materials
- That are responsibly sourced
- Use recycled materials
- Ensure the building can be recycled
- Use minimal energy in use
- Rigorously control upstream and downstream impacts

Low Impact Materials

- Earth
- Combustion Waste (though this may have other drawbacks)
- Bio composites
- Recycled materials

Renewable Materials?

- Hemp
- Straw
- Timber
- Wool
- Bamboo

Building with hemp

The “Grow Build” project

- Can be a main stream solution
- Quality control can be achieved
- Breathable, healthy
- Warm, energy efficient
- Provides new crop for agriculture and rural economy
- Added value to low value material

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Importance of Health

- Pollution in the home and office now more serious than external pollution
- Exponential increase in asthma is related to toxics in the home

Enlarging the market for green materials

- EPSRC project on the opportunities and obstacles, (work with partners)
- The Cost excuse
- Specification substitution
- Lack of availability
- Ignorance of alternatives
- Lack of Government support