Healthy Buildings – Healthy Environment

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Healthy Buildings

- 90% of our time spent indoors
- 90% of business costs are for staff salaries

- Effect of the indoor environment on productivity is not considered the same way as energy performance.
Impact of IEQ on productivity

- Difficult to quantify (but not impossible)
- Often subjective
- Not straightforward
- Not all aspects controllable
Healthy Buildings – Internal Air Quality

• **Poor indoor air quality**

  ➢ Indoor concentration of pollutants can be 2-50 times that of outdoor concentration

  ➢ Indoor environments are the main exposure path to many air pollutants (e.g. benzene)

  ➢ Asthma, cancer, allergies, eye irritation (PAHs, formaldehyde)

  ➢ 8%-11% improvement in productivity from better air quality not uncommon
Cambridge – Murdoch House

- **Energy vs staff costs**

  ➢ 187 staff

  ➢ 10% reduction
What are indoor air pollutants?

- Combustion products
- Biological pollutants
- Radon
- Asbestos
- Secondhand tobacco smoke
- Endocrine disruptors
- Formaldehyde
- Other organic chemicals
- Particulate matter
Healthy Buildings – Internal Air Quality

- Sources of poor indoor air
  - Carpets
  - Heating systems
  - Photocopiers
  - Composite wood
  - Other people
  - Smoking
  - Soft furnishings
  - Outside air
  - Cleaning products
  - Building products
Healthy Buildings

- **Eliminating indoor air pollutants**
  - Ventilation & source control

Increased ventilation eliminates pollutants but works against energy efficiency targets. Source control reduces the need for ventilation.
Healthy Buildings

• Source control

- What do the red arrows mean?
- Do we know what comes out of products inside buildings?

There are no ingredients labels on building products.
What to do?

- **Precautionary principle** - Chemical / substance content ban…?
  
  - Which chemicals?
  - In what concentration?
  - Health hazard assessments inconsistent / unreliable
  - Technically impossible for certain products/industries

The industry is not ready for this approach.
What are the drivers?

- Voluntary benchmarking systems and ecolabels
Too many labels

- Don’t incorporate the same chemical compounds
- Often use different testing protocols
- Define various compliance limits
What to do?

- Precautionary principle  
- Long-term approach
  - No chemical ban
  - Encourage disclosure of product contents
  - Information brings choice for designers
  - Choice brings competition among manufacturers
  - Competition leads to product improvements

⇒ Long-term elimination of hazardous substances across the industry
What are the drivers?

- **Voluntary benchmarking systems and ecolabels**

- **EU and national legislation**
  - Construction Products Regulation
  - National regulations for product emissions in Belgium, Germany and France (not the UK)
  - Environmental Product Declarations
How to do it?

- Early involvement
- Develop clear strategy and targets at Stage 0/1
- Consider your procurement route carefully!
- Clearly define roles and responsibilities for:
  - Architect
  - Main Contractor
  - Subcontractors
- Engage with manufacturers early on
- Assess willingness to collaborate
- Select manufacturers accordingly
What we did

• How we did it

  ➢ Organised by procurement package
  ➢ Subcontractors responsible for managing their manufacturers
    ▪ No installation without disclosure
    ▪ Limits risk for client but increases risk for contractors
    ▪ Increased risk can lead to increased cost
  ➢ Used tender stage to assess willingness to participate
  ➢ Entered Stage 4 with collaborative contractors and manufacturers
• Lessons learned

- The industry is responding and moving in the right direction

- Too early for some parts of the industry
  - Some industries are very advanced, others less so
  - Releasing content information is often unacceptable
    - Sometimes because of real IP concerns
    - More often because transparency is not in the culture

- Content vs Emissions: different approaches, different results

- Too many ecolabels with different standards, limits, etc

- Lack of common testing methods
• Voluntary benchmarking systems and ecolabels
Way forward?

- **Products**
  - Transparency
  - Compliance
  - Knowledge
  - Disclosure

- **Research**
  - Modelling
  - Post-occupancy testing
  - Additive effects

- **Application**
  - Predictability
  - Business case
  - KPIs