Indoor environmental quality and energy efficient buildings

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Indoor Environment of Buildings

Up to 90% of our life we spend indoors...

Indoors we are exposed to up to 5x higher air pollution than outdoors.

Indoor environment influences

• Health
• Performance in work
• Comfort


“Energy Efficiency first”

YES…

There is a massive energy saving potential yet to be exploited in buildings in Europe.

BUT…

Buildings energy refurbishment needs a holistic approach considering energy efficiency and IEQ at the same time.
SMART TECHNOLOGIES FOR ENERGY EFFICIENT BUILDINGS

Source: prof. Karel Kabele
Holistic approach with 8 metrics

**Economy**
- Lifecycle Cost (EN 15643-4)

**Energy**
- Imported energy
- Imported primary energy
- Baseload power

**Global warming**
- Life-cycle carbon footprint (EN 15978)
- Operating carbon footprint (GHG Protocol)

**Occupants**
- Indoor air quality classification
- Share of satisfied occupants
Staff costs, including salaries and benefits, typically account for about 90% of business operating costs.

Source: Health, Wellbeing & Productivity in Offices by WBCG
In the current market valuation **plant systems benefits** are not straight contemplated

**crucial relevance of a suitable building valuation** to give useful information to investors and decision makers

**Why is it a crucial problem for the systems suppliers?**

Because fundamental challenges taking place in the market make it ripe for innovation:

- Integration of renewable energy
- Energy efficiency
- Improved comfort
- Occupants’ interaction

**HVAC benefits valuation can support the innovation**