

Ventilation og oplevet luftkvalitet ved forskellige materialevalg



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EFP 2005 projekt

Formål

at bestemme hvor meget energiforbruget til ventilation af bygninger kan reduceres, hvis der systematisk vælges lav-forurenende materialer uden at det forringer indeluftkvaliteten

EFP 2005 projekt

Fase 1: Materialeudvælgelse

- Litteratur studium og forsøg i lille skala

Fase 2: Forsøg i fuld skala rum

Fase 3: Energisparepotentiale?

Background

EU Directive on Energy Performance of Buildings (2002/91/EC)

- Reduce energy use of buildings without compromising the indoor environment

Bygningsreglement, Regeringsbeslutning

- mål at reducere energiforbruget med 25 % i 2010 og 25 % i 2015

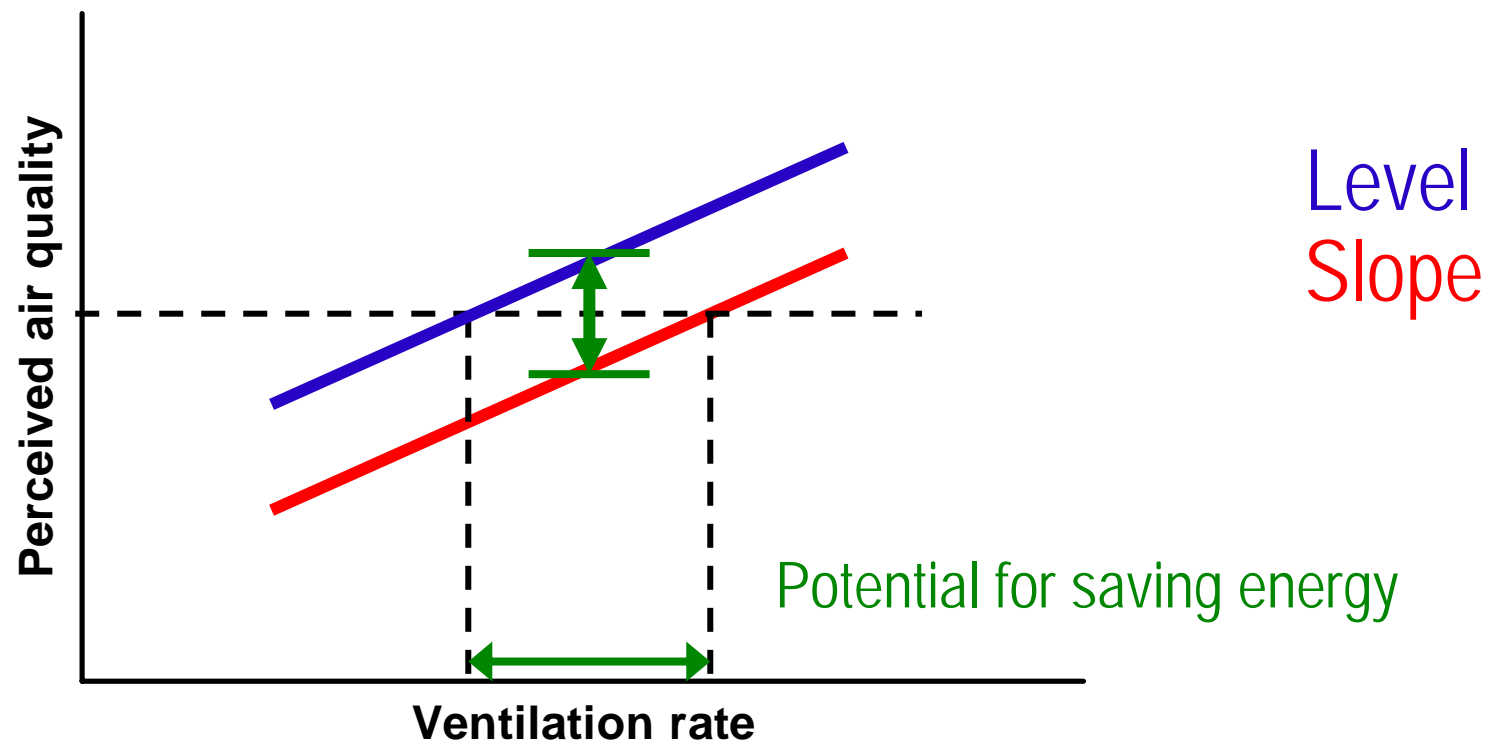
Part of a solution

- Reduce energy consumption for ventilation by using low-polluting materials



Literature review + unpublished data

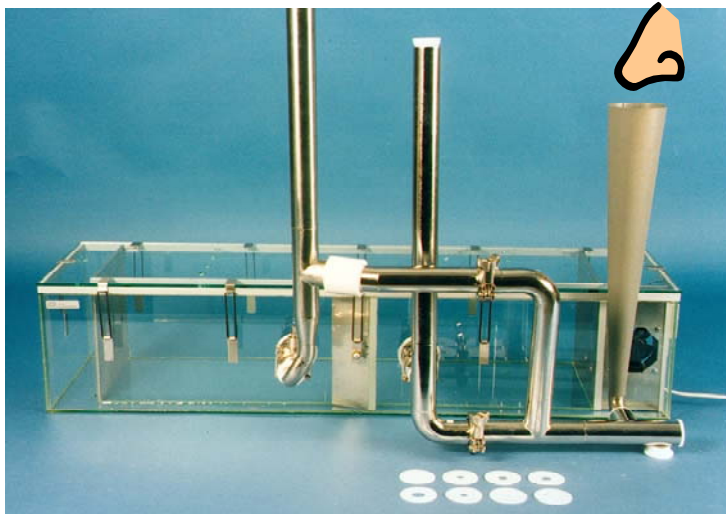
To summarise existing data on how varying ventilation rate affects the perceived quality of air polluted by building materials and rooms



Data

Small-scale (5 studies)

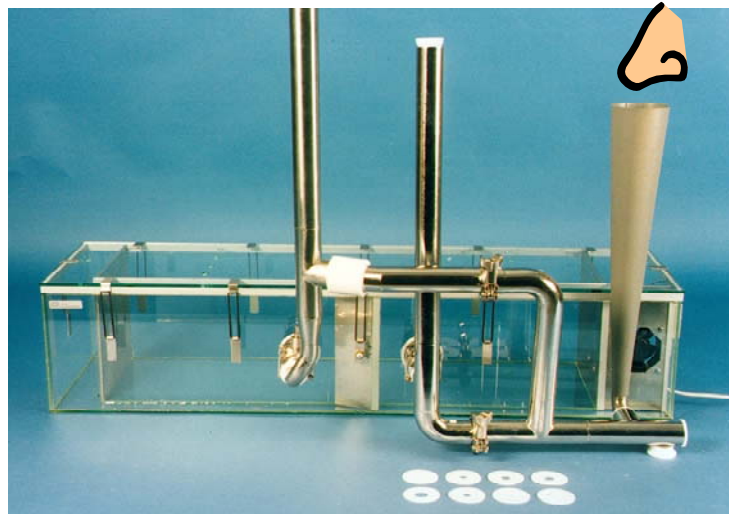
- 12 hard floor coverings
- 10 carpets
- 5 wall paints
- 4 sealants
- 3 other materials



Data

Small-scale (5 studies)

- 12 hard floor coverings
- 10 carpets
- 5 wall paints
- 4 sealants
- 3 other materials



Full-scale (5 studies)

- 12 office rooms



Sensory data

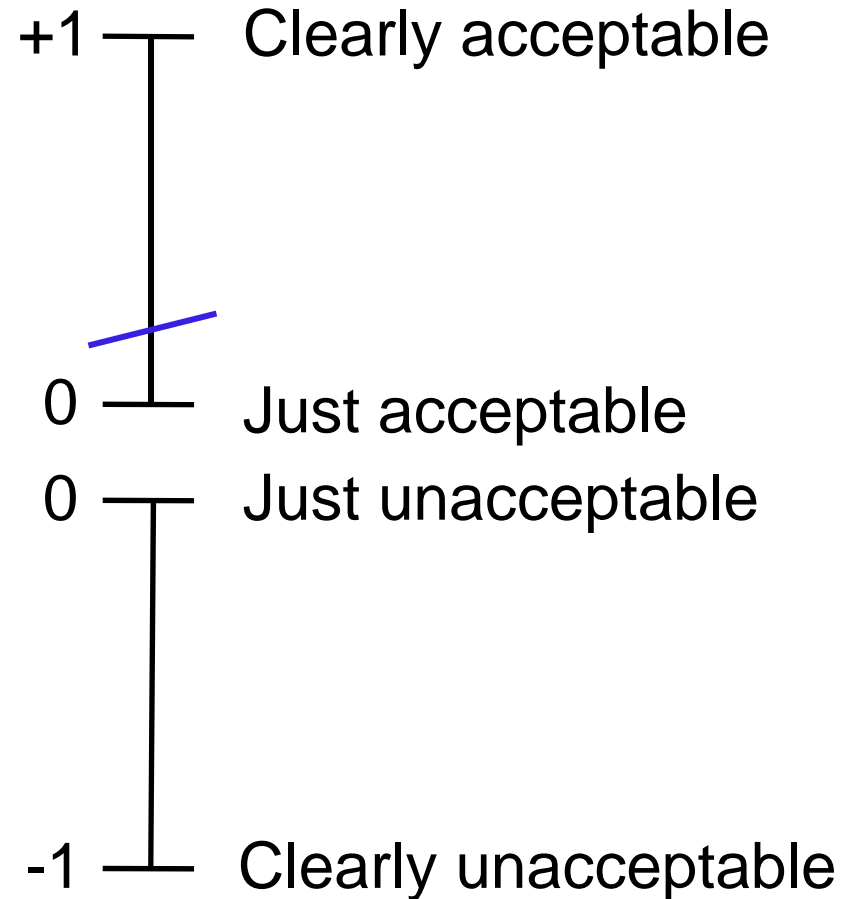
- Untrained panel
- Acceptability
- 20 – 40 naive assessors



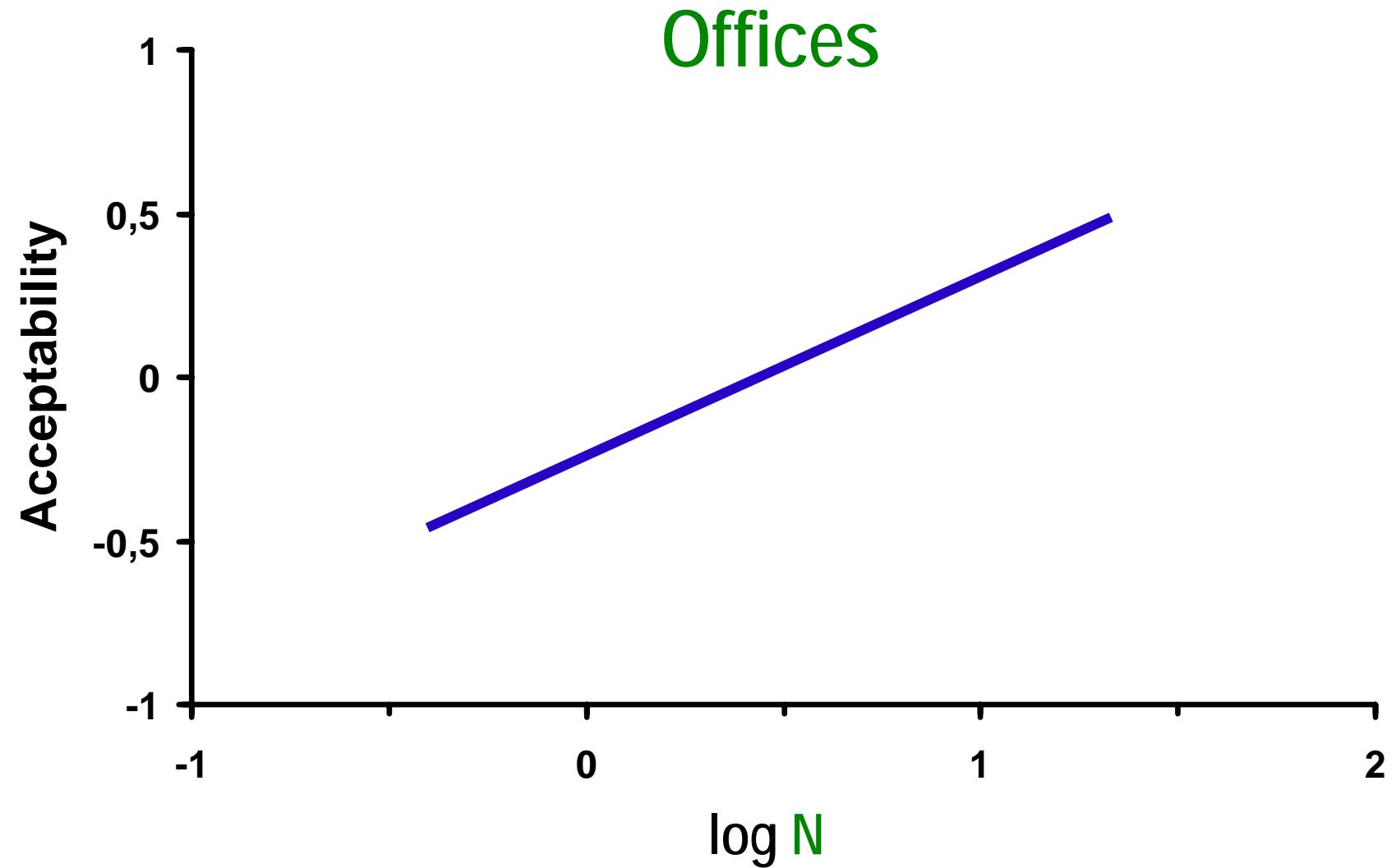
Acceptability

Imagine that you, during your daily work, would be exposed to this air.

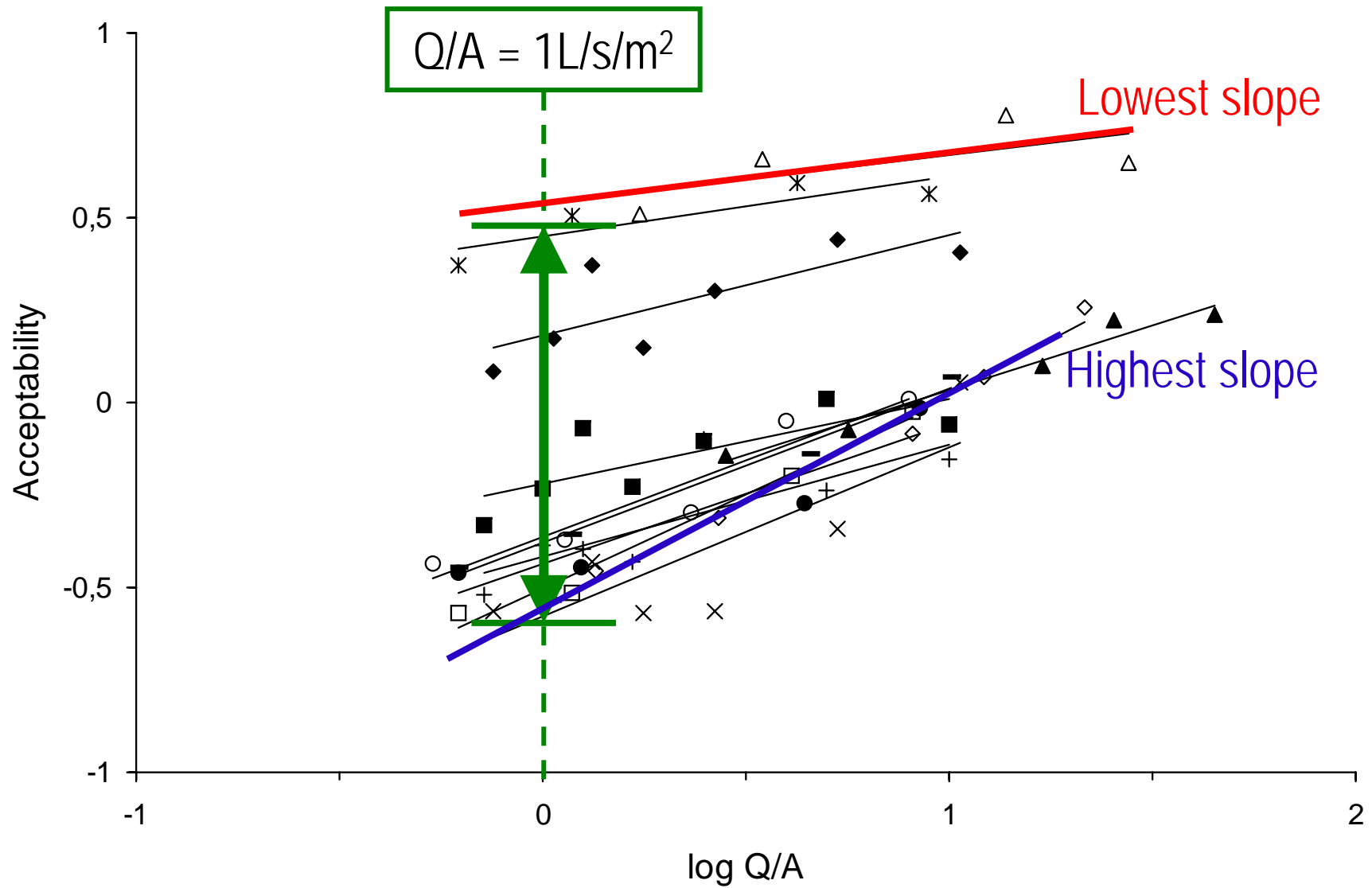
How acceptable is the air quality?



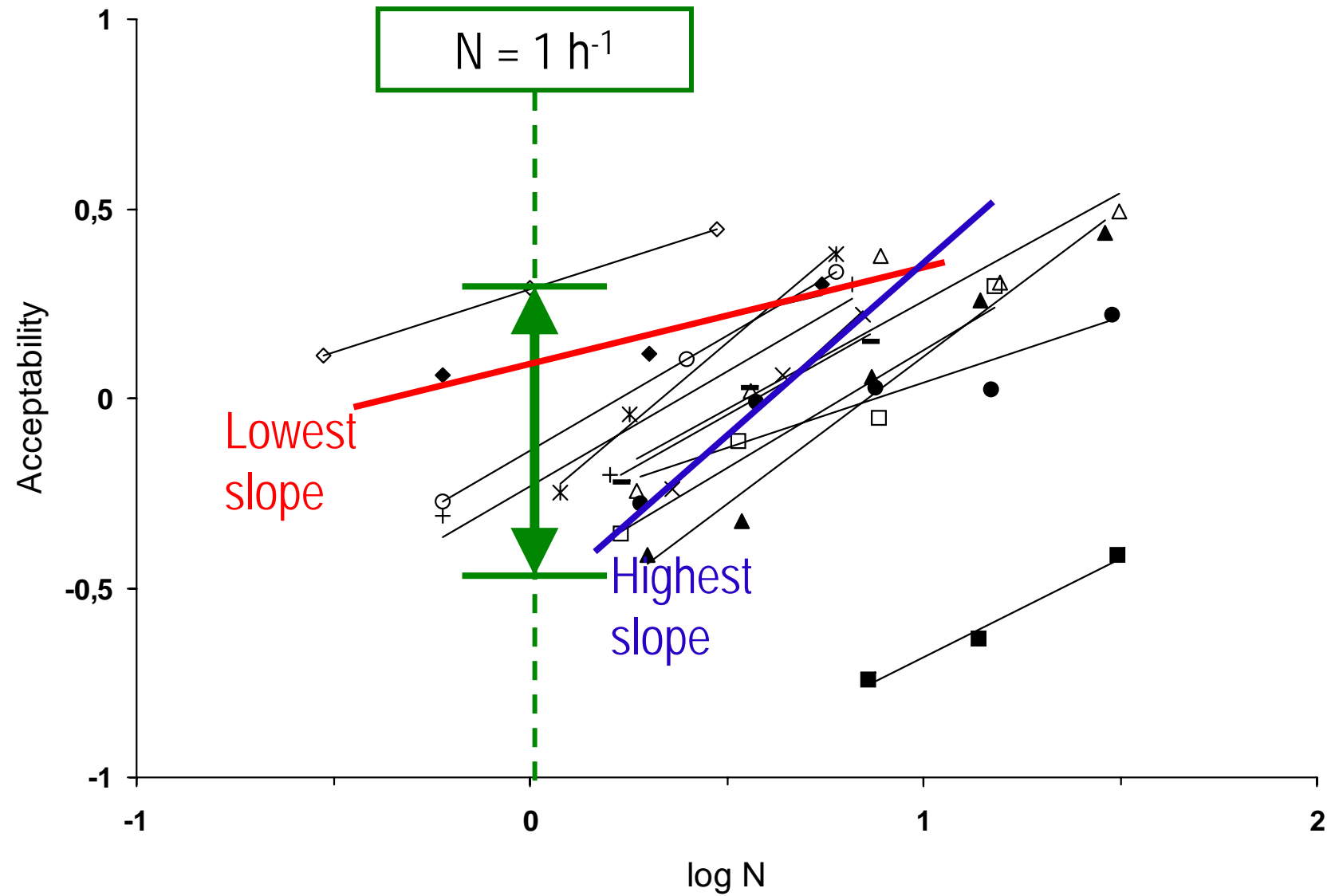
Analysis of data



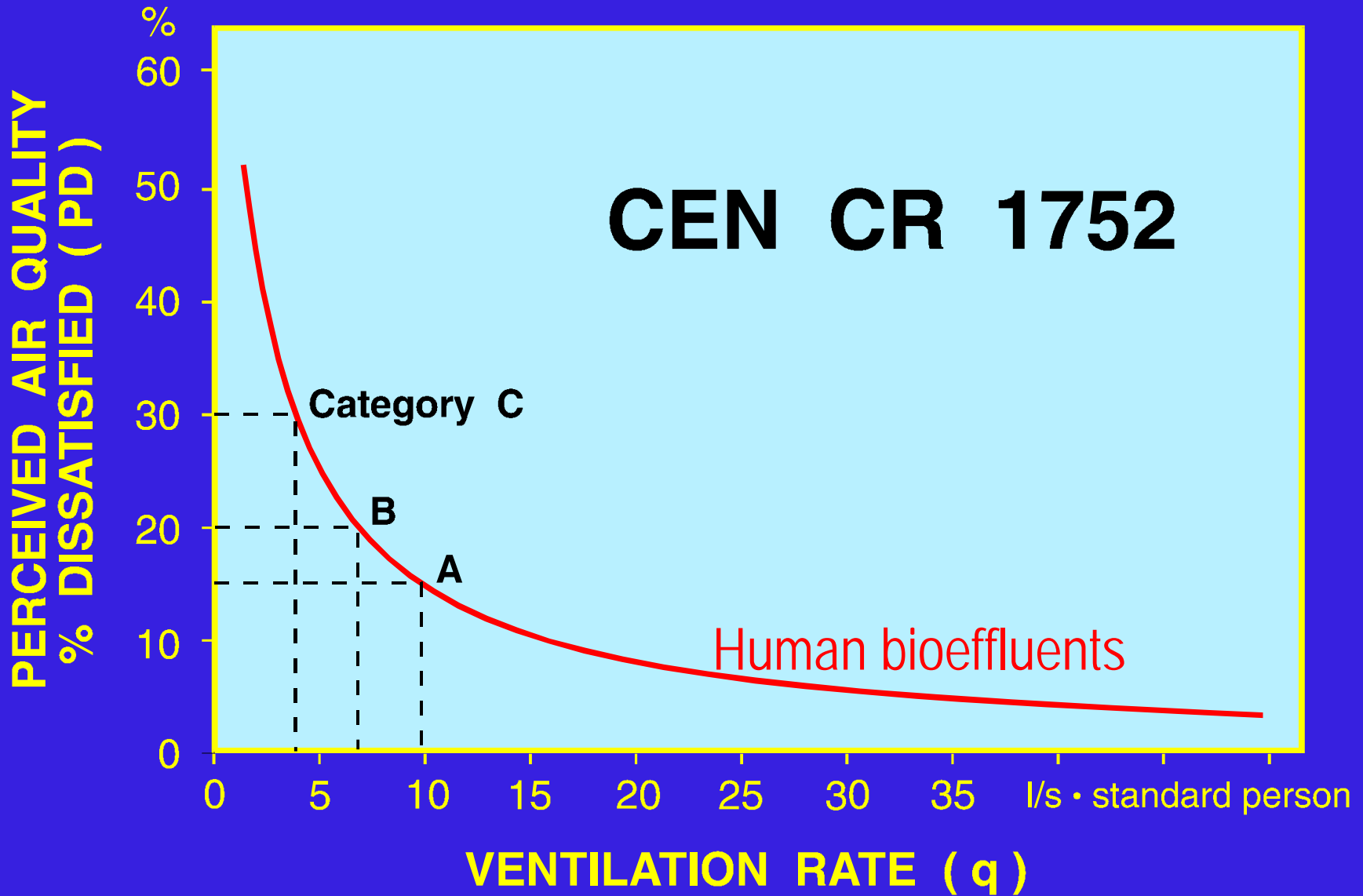
Small-scale: hard floor coverings



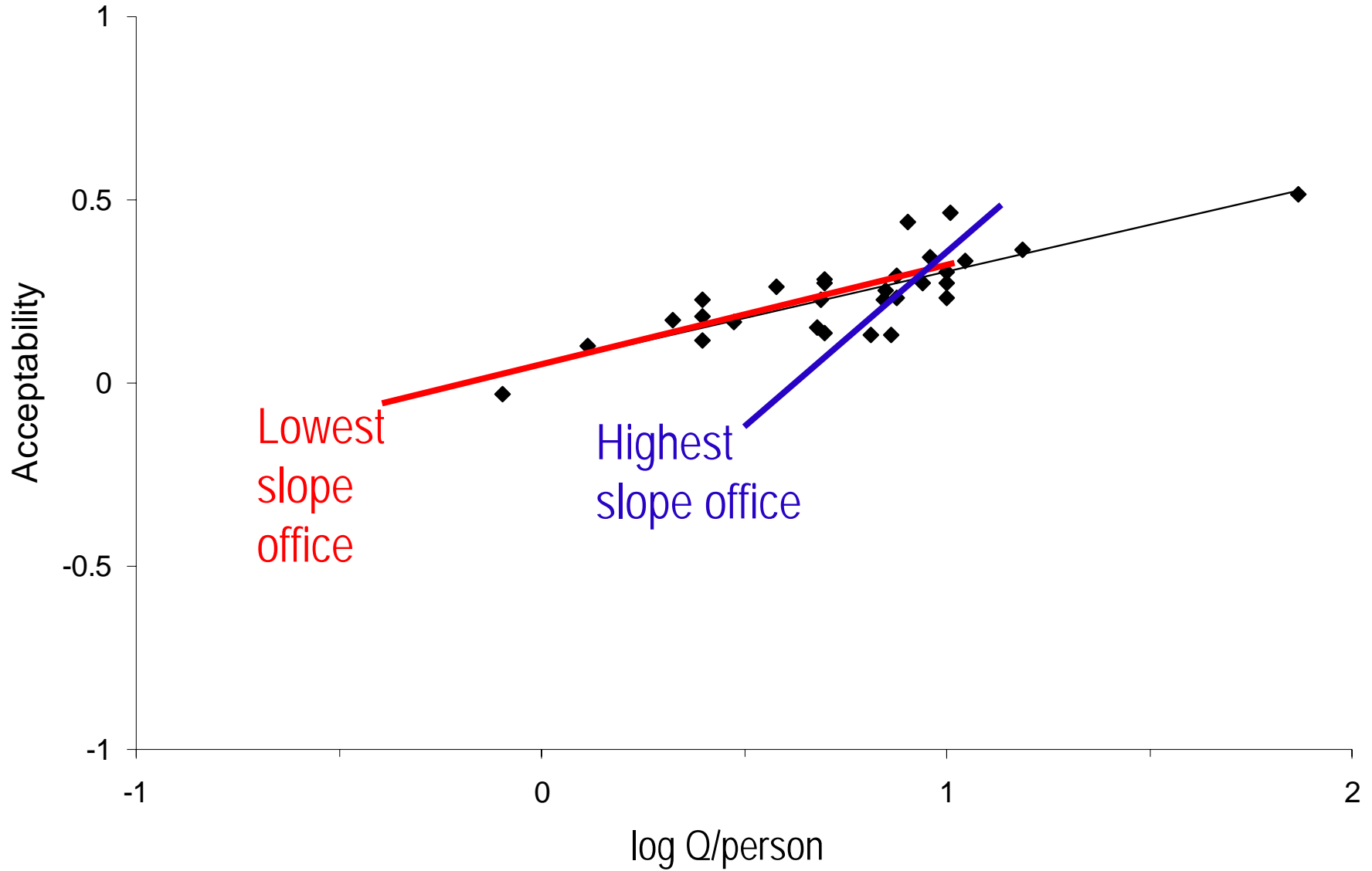
Full-scale: offices



Ventilation standard



Human bioeffluents



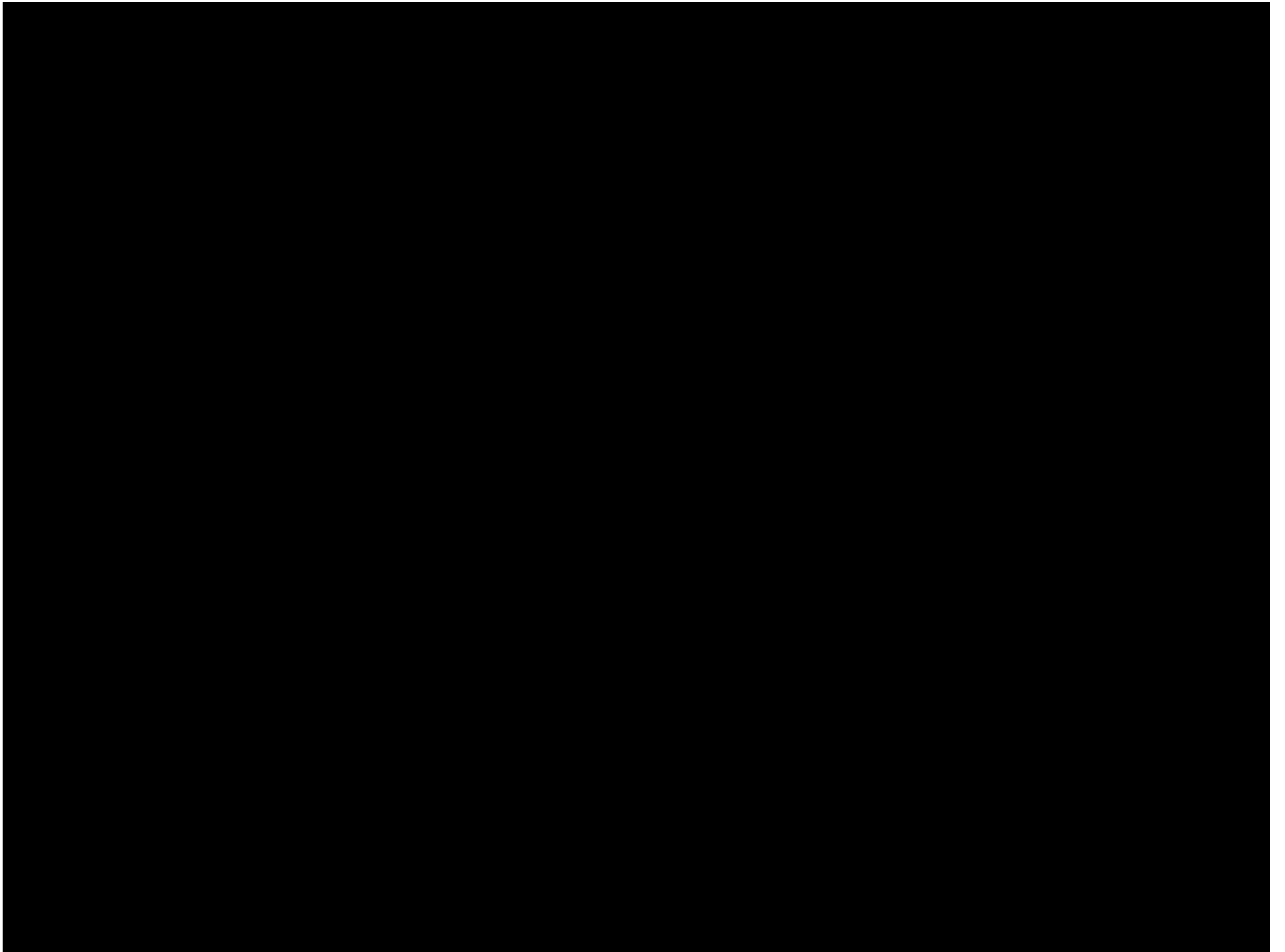
Conclusions

- The relationships between ventilation rate and perceived air quality are different for different building materials/rooms, with respect to level and slope
- To save energy for ventilation it is recommended to use low-polluting materials with an exposure-response relationship with a low slope

Next step

- Verify the practical significance of the summarised results in well-controlled realistic full-scale experiments





Danish Building Research Institute Department of Health and Comfort

- Indoor air quality
- Perceived air quality
- Emissions from building materials
- Pollutants in indoor air
- Indoor climate assessments
- Building users' perception of the indoor climate
- Design methods
- Ventilation requirements
- Daylight and solar shading
- Lighting



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