

The Indoor Air Perspective in the EU

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The Indoor Air Perspective in the EU

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The Indoor Air Perspective in the EU

1. Context
2. Driving forces for IAQ
3. Highlights on actions and results in the EU
4. Basis for policies on IAQ
5. IAQ in the future
6. Conclusion

1. IAQ and Health

- People spend 80-90% time indoors
- Indoor environments have changed enormously with often bad IAQ:
 - Outdoor air, human activities, soft furnishings, fitted carpets, equipments and mechanical air ventilation systems
 - Decrease of the rate at which indoor air is exchanged for fresh air
- Evidence of health effects

1. IAQ and Health

- Complexity of pollutants present in indoor environments.
- Indoor air pollution may cause or aggravate illnesses, increase mortality, and have an important economic and social impact.
- The right to breathe healthy air has been recognised as a fundamental right by WHO in 2000.

1. Strategies

Regulatory risk management strategies (examples)

- Bans of chemicals or products
- Emission limits
- Labelling requirements
- Exposure level limits
- Standards for building design
- Building operation and maintenance requirements
- Ventilation standards

1. Strategies

Non-regulatory risk management strategies (examples)

- Guidelines (for IAQ, ventilation, etc)
- Market and fiscal incentives
- Population information campaigns
- Training and education of actors (building owners, building managers, IAQ specialists, etc.)
- Support to “clean” technologies
- Research

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2. Driving forces for IAQ

- **Health** – of course, is the reason but it is too far downstream! (from cancer to SBS and discomfort)
- **Energy & comfort** – ventilation link; comfort concepts (HVAC)
- **Exposure** – mostly for outdoor air; little on indoor air (chemicals, PM₁₀, time scales,...)
- **Productivity** – mist area with very costly consequences

2. Driving forces for IAQ - Drawbacks

- Ambient air being considered to be the issue and politicians were not ready till 2002 to consider IAQ as a public policy issue.
- Exposure and health studies not enough advanced in particular to respond to IAQ related issues.
- Some initial assumptions proven to be wrong or not well justified (TVOC, sensory evaluation, data bases, dynamics of adsorption/desorption indoors...)
- Productivity IAQ problems in offices still overwhelmed by the fashion of being 'air conditioned'...

3. Highlights on actions and results

- Scandinavian reaction to the effects on indoor air of tighter buildings after the second 'oil crisis' (early 80's)
- JRC/ECA Projects since the late eighties
- European directives (CPD, 108/86 and EPBD, 92/2001)
- National legislation, building codes, IAQ actions and materials labeling schemes, etc.
- European standards and national standards
- Industrial quality control and certification programs
- International (WHO) and national guidelines
- R&D Projects

3. Highlights on actions and results

Some cases of (quite recent) health driven projects on IAQ

(supported by DG Research or Sanco)

- ENHIS
- HITEA
- VITO study
- PINCHE
- THADE
- GA2LEN
- CAIR4Health
- BUMA
- HealthyAir
- PRONET

3. Highlights on actions and results

Some cases of energy driven projects on IAQ

Date	Project	(all supported by DGResearch)
1991 - 1995	AUDIT	59 Office buildings - assessment
1994 - 1997	EDBIAPS	indoor air pollution sources - database
1996 - 1998	VOCEM	VOC emissions from building products
1997 - 2000	AIRLESS	characterizing the HVAC systems
1998 - 2001	MATHIS	characterizing materials
2002 - 2004	SOPHIE	from sources to ventilation - database
2002 - 2004	HOPE	Energy efficient buildings & IAQ

3. Highlights on actions and results


Some cases of policies driven projects on IAQ

Date	Project	Financed by
undergoing	WHO IAQ Guidelines	
undergoing	DG Sanco IAQ expert group	
2002 - 2004	INDEX - Priority pollutants	JRC
2003 - ...	Labelling - Materials market	JRC
2005	STRATEX - Exposure on IAQ	JRC
2001 - ...	EPBD (+IAQ?) - Dir 92/2001	MS
1989 - ...	CPD, ER # 3	M366 to CEN
2004 - 2008	EnVIE - Policies	6 th FP DGResearch

3. Highlights on actions and results

A rather comprehensive and coherent pathway (ECA/JRC)

Subject	Report numbers
Radon	1, 15
Formaldehyde	2, 7
NO ₂	3
SBS	4
Chemical substances, VOCs, Labelling	6, 8, 13, 14, 16, 18, 19, 21, 24
Indoor Air & Health, Risk Assessment	10, 22
Indoor Air & Energy, Ventilation	11, 17, 23
Biological particles	12
Sensory evaluation	20
Policies, strategy	25



ECA - EUROPEAN COLLABORATIVE ACTION
on "Urban Air, Indoor Environment and Human Exposure"

3. Highlights on actions and results

IAQ Policy Results

- ETS to be banned/drastically reduced in public spaces
- Benzene and formaldehyde defined as carcinogenic
- Labeling schemes in different countries with relevant impact in the enhancement of the quality of materials in those MS
- EPBD (including IAQ in one MS)
- Certification processes underway
- REACH is very promising

3. Highlights on actions and results

- INDEX chemicals recommended for regulation
 - Benzene
 - Formaldehyde
 - Naphthalene
 - Carbon monoxide
 - Nitrogen dioxide

3. Highlights on actions and results

REACH

- European Community Regulation on chemicals and their safe use (EC 1907/2006).
- Registration, Evaluation, Authorization and Restriction of Chemical substances.
- Entered into force on 1 June 2007.

REACH will improve the protection of human health and the environment through a better and earlier identification of the intrinsic properties of chemical substances.

But the benefits of the REACH system will come gradually, as more and more substances are phased into REACH.

4. Basis for policies on IAQ

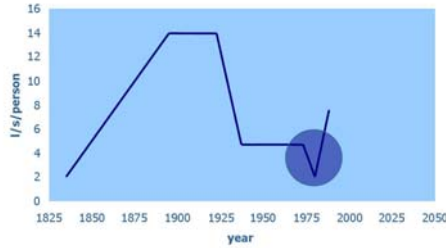
IAQ management strategies

- Source control
 - clean materials, moisture control, confining or restricting activities, local exhaust ...
- Dilution
 - natural or mechanical (ventilation)
- Cleaning the air
 - filtration, renovation (ach) (ventilation)

4. Basis for policies on IAQ

Ventilation

Ventilation along the time or simply a too complex issue!



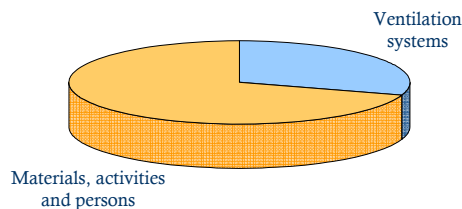
Year	Ventilation rate (l/s/person)
1825	2
1850	8
1875	12
1900	14
1925	14
1950	4.5
1975	2
2000	7
2025	4
2050	6

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4. Basis for policies on IAQ

Ventilation

HVAC systems as chemical pollution sources*



* IAQ Audit, 1992-94

4. Basis for policies on IAQ

Ideal situation

- Knowledge on exposures and all potential causes and sources
- Knowledge on the causality of concerned health effects
- Risk assessment: statistics associated with fatalities (exp. benzene,...)
- Risk management

4. Basis for policies on IAQ

Source control

- Outdoor air (*obvious but not critical: policies on ambient air quality!*)
- Occupants
 - behavior (candles, deodorants, etc.)
 - activities (**smoking**, cooking, copying, etc.)
 - some can be banned
 - others confined
- Materials (construction, covering, furniture)
- HVAC (design, construction, maintenance)
- Misuse/mismanagement (dampness, moulds)

4. Basis for policies on IAQ

Obstacles

- Little knowledge on indoor exposures and on the potential causes
- Very poor and confined knowledge on the toxicity of most materials
- New materials/substances emerging all the time in the market
- Risk assessment only possible for a few cases (INDEX)
- Some (vanishing?) reluctance from the industry side

4. Basis for policies on IAQ

Mitigation measures

Materials

- REACH Directive (years to go in an almost never ending race)
- Labeling (MS and voluntary, so far)
- Certification (Softer approach)

Construction

- CPD Directive (Specific Requirement #3)
- EPBD Directive (energy efficiency + IAQ)

4. Basis for policies on IAQ

Labeling



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4. Basis for policies on IAQ

Labeling

International Conference
"Construction Products and Indoor Air Quality"
Berlin, June 4-5, 2007



Acquired

1. We are all in the same boat...
2. Labelling schemes, at the end, look much more to be similar than different;
3. There are signals that there is a general attitude towards convergence of all schemes;
4. Technical aspects don't seem to represent the obstacle to the harmonization;
5. Prospects on DGs cooperation seem promising!



4. Basis for policies on IAQ

Labeling

International Conference
"Construction Products and Indoor Air Quality"
Berlin, June 4-5, 2007



Still to be acquired

1. How to interconnect powers: EC, MS & Others
2. Voluntary, Mandatory or somehow in between or both;
3. Schemes are too much focused on materials and components. Only M1 considers the building as a whole. Performance based approach is urgently needed.
4. Need to clarify how to pass from tests to real spaces and from tests to effects on health & comfort.
5. Need for a strategy on IAQ and health. Is it reasonable to wait until October 2008 (EnVIE) ?



4. Basis for policies on IAQ

Certification

- Certification

The main purpose is to protect consumers from exposure to chemical pollutants and resulting adverse health effects (i.e. carcinogenic, teratogenic, irritant factors) or annoyance from bad odours which could be caused by chemical emissions from materials.

This protection can be effectively achieved by supporting the market demand for low emitting materials.



4. Basis for policies on IAQ

EU Construction Products Directive (CPD)

Essential requirements:

- Mechanical resistance and stability
- Safety in case of fire
- Hygiene, health and the environment
- Safety in use
- Protection against noise
- Energy economy and heat retention

4. Basis for policies on IAQ

EU Construction Products Directive (CPD)

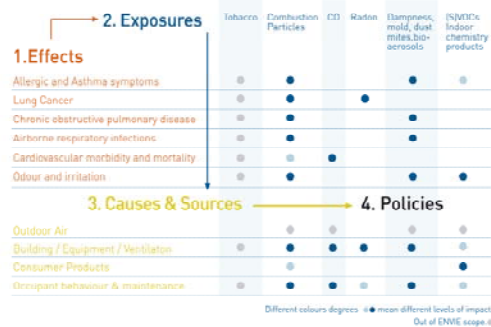
Essential requirement 3:

Hygiene, health and the environment

- The giving-off of toxic gas
- The presence of dangerous particles or gases in the air
- The emission of dangerous radiation
- Pollution or poisoning of the water or soil

4. Basis for policies on IAQ

EnVIE concept



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4. Basis for policies on IAQ

3.4 EnVIE concept

- Starting from the most relevant indoor air related health outcomes
- Identifying the most widespread indoor air exposures which are likely to cause these health outcomes
- Defining space and source characterisation which dominate the indoor air exposures
- In order to suggest a set of beneficial and feasible indoor air quality policy alternatives for Europe

4. Basis for policies on IAQ – remaining issues

- Is it a priority to promote more research on IAQ health related issues. If yes, how to set the priorities. Sensitive populations?
- How to link exposures (schools, homes, ...) with health effects
- Cohort studies needed have shown to be very expensive
- How to integrate the existing knowledge across manufacturers, builders, etc.
- How to overcome the resistance from the industry regarding labeling systems
- How to handle economics and the precautionary principle regarding health
- How to draw the avenues of the future regarding IAQ and health

5. IAQ in the future

- WHO - Guidelines
- DG Sanco – Policies
- DG Research - R&D
EnVIE – Policies
- CPD and EPBD Directives - CEN TC 351

5. IAQ in the future

DG Sanco

- Working group on Indoor Air Quality Experts
 - Information and education to the public ([Website](#))
 - Working with MS on issues related to priority compounds
 - Working with industry
 - Coordinate Commission activities on Health
- Working party ...

5. IAQ in the future

DG Enterprise / CEN /CPD

- Expert Group on dangerous substances in construction products (EGDS)
- EU database – European and national regulations for dangerous substances in construction products
- Mandate M/366 to CEN for the development of horizontal test methods for dangerous substances in construction products - CEN TC 351
- Revision of the existing mandates for construction products with respect to the implementation of ER 3

5. IAQ in the future

DG Enterprise / CEN /CPD

- Evaluation of construction products shall consider the content as well as the release of dangerous substances
- Emission scenarios / tests shall be oriented to the intended use of the construction products taken into account
- European discussion in order to improve harmonised technical specifications with respect to the fulfilment of ER 3
- Main target: low-emission products for the purpose of healthier buildings

5. IAQ in the future

CEN TC 351

- CEN established in November 2005 a new Technical Committee (CEN/TC) with the number 351 and the title "Construction products: Assessment of release of dangerous substances".
- This TC will adopt assessment methods with which information may be given in the CE marking of construction products on the release of dangerous substances in the use phase.

5. IAQ in the future

EnVIE objectives

- To contribute for a better understanding of the indoor air quality impact on health (asthma and allergies)
- To elaborate and propose a framework related to IAQ to support European policies on environment and public health



5. IAQ in the future

Envie 2008 events

March, 5-6, Workshop

Brussels, under invitation trying to gather most of the project leaders of recent years

September, 16-17, Final Conference

Brussels, open under free registration condition

October, 31, Presentation of the Final Report



6. Conclusion

IAQ to become, naturally, part of a wider system or process of performance assessment of the built environment quality under the long range heading of `sustainability`

Which could shortly be presented as part of a program for something like `health and climate change mitigation`!

The issues are the same while the motivation may change somehow!



Contacts

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