

EnVIE Conference

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„Policies for millions of indoor environments“

A German view on tools and measures to improve IAQ

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Existing policies/legislation



WHO Guidelines	WHO Guidelines for IAQ: Dampness & mould		
CAFE Dir. 96/62/EC, 99/30/EC, 2000/69/EC, 2002/3/EC	90/143/Euratom ⁵ , 2002/91/EC (EPBD) ⁶ , 2002/95/EC ⁷ , 2005/32/EC ⁷ , 89/106/EEC (CPD) ⁸ , 2004/42/EC ⁹ , 2006/121/EC ¹⁰	2001/95/EC ¹¹ (GPS), 2006/121/EC ¹⁰	90/396/EEC ¹² , 92/42/EEC ¹³ , 2006/121/EC ¹⁰
	Building codes EPBD + IAQ (PT)		Voluntary labelling schemes for materials (FI, DK, GE, FR,...)

- Legend: Different colours degrees ● mean different levels of imp. Out of ENVIE scope. ●
- 1) Taken as granted. Out of EnVIE scope.
 - 2) Building materials; paints; HVAC systems;...
 - 3) Furniture; mattresses; upholstery; candles; incense; air 'freshners';...
 - 4) Cooking; fireplaces; cleaning products; air cleaners; varnishes; waxes;...
 - 5) Radon
 - 6) Energy Buildings Performance Directive
 - 7) Electrical appliances
 - 8) Construction Products Directive (E. Req. #3)
 - 9) Paints & varnishes
 - 10) REACH
 - 11) General Products Safety Directive
 - 12) Burning appliances
 - 13) Boilers

Legend:

- WHO Guidelines
- EC Policies/Legislation
- Member States Policies/Legislation

Proposed policies

- Directive on IAQ (!)
- REACH + CPD + EPBD (incl. IAQ response)
- Harmonised voluntary labelling schemes
- Consumer products labelling
- Monitoring systems & schemes through EU

German Environmental Survey GerES IV 2003-2006: Tools

Blood



Urine



Drinking water



House dust



Indoor air



**Indoor air, dust
from floor and
mattresses**



Questionnaire



**Screening
Audiometry**



Monitoring in Germany

GerES IV 2003-2006

Monitoring systems & schemes through EU

Goals

- Identification of risk and riskgroups
- Identification of routes of exposure

Data as basis for

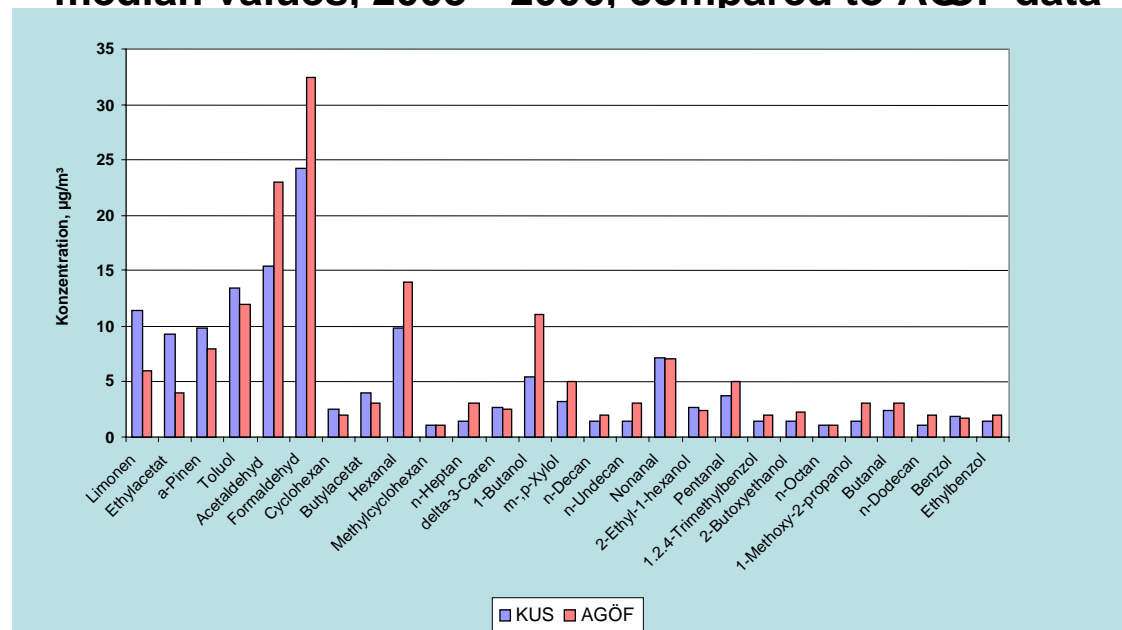
- Targeted risk communication
- Evidence for political actions

Exemple here: ETS..



Monitoring VOC concentrations in German homes, (GerES IV: childrens rooms or living spaces)

Recent data of the German Environmental Survey, median values, 2003 – 2006, compared to AGÖF data



Chemical groups with priority for guideline values

Monitoring systems & schemes through EU

- Aldehydes
- Glycolethers
- Terpenes
- Phthalates
- Biocides

New relevant substances (e.g. Siloxanes)

Indoor Air Guideline Values

established by Indoor Air Hygiene Commission at UBA, *ad-hoc* working group

	Guideline value II (mg/m³)	Guideline value I (mg/m³)	Defined in
Toluene	3	0,3	1996
Dichloromethane	2 (24 h)	0,2	1997
CO	60 (30 min)	6 (30 min)	1997
	15 (8 h)	1.5 (8 h)	
PCP	0,001	0,0001	1997
NO₂	0,35 (30 min)	--	1998
	0,06 (1 week)		
Styrene	0,3	0,03	1998
Hg	0,00035	0,000035	1999
TCEP	0,05	0,005	2002
Alpha-Pinene	2	0,2	2003
Naphthalene	0,02	0,002	2004
Aliphatic hydrocarbon solvent (C9-C14)	2	0,2	2005



Importance of emission testing - UBA's own experience

Consumer products labelling

**2004
....New
Building
of UBA
in Dessau**



Indoor Air Concentrations several weeks after installing a rubber flooring material

Site	conditions	Naphthalene ($\mu\text{g}/\text{m}^3$)			TVOC ($\mu\text{g}/\text{m}^3$)		
		closed	after ventil.	open	closed	after ventil.	open
Room 3.006	with rubber flooring	56	47		730	550	
Room 3.007	with r.f.	61	50		790	560	
Room 3.008	with r.f.	62	50		780	500	
Room 3.009	with r.f.			45			530
Room 3.031	without r.f.nearby	16			550		
Room 3.180	without nearby	14			570		
Room 3.313	without distant	3			680		

UBA Dessau, 7.7.2004, active sampling, 21°C

UBA's own experience

- Emission test on new flooring material revealed a lot of naphthalene – and another very unpleasant surprise:

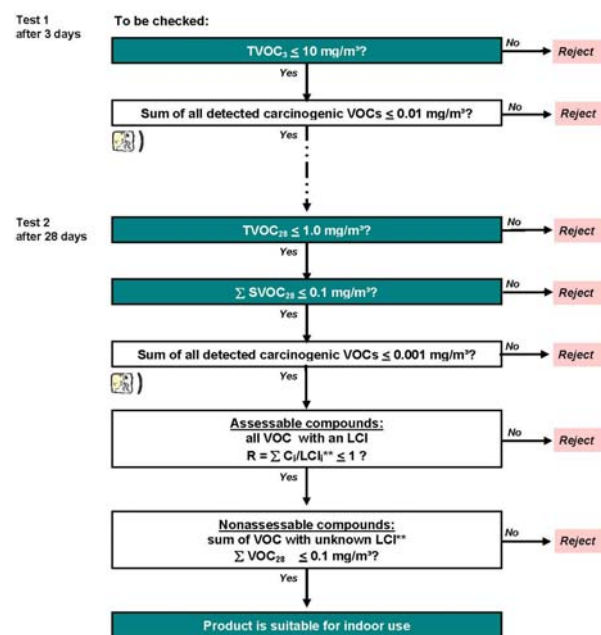
Emissionen nach 28 Tagen			Elutionsbereich (Retentionszeitfenster)	C _i [µg/m³]	SER _i [µg/m²h]	Zuordnung [canc./NIK/o.NIK]	R _i [bei NIK-Substanzen]
XX Bodenbelag alte Charge	CAS-Nr.	RT [min]					
gefundene Substanzen							
Styrol	100-42-5	17,45	TVOC	21	21	NIK 860	0,024
→ 1,3-Dichlor-2-propanol	96-23-1	17,62	TVOC	22	22	als Canc. gel.	
Cyclohexanon	108-94-1	17,66	TVOC	12	12	NIK 400	0,030
Octamethylcyclotetrasiloxan	556-67-2	21,93	TVOC	86	86	NIK 1200	0,072
1.2.4-Trimethylbenzol	95-63-6	22,22	TVOC	8	8	NIK 1000	0,008
n-Dodecan	112-40-3	28,42	TVOC	8	8	NIK 21000	0,000
→ Naphthalin	91-20-3	28,61	TVOC	136	137	NIK 50	2,720
Benzothiazol		29,66	TVOC	72	72	ohne NIK	
n-Tetradecan	629-59-4	32,77	TVOC	11	11	NIK 21000	0,001
n-Pentadecan	629-62-9	34,60	TVOC	4	4	NIK 21000	0,000
n-Hexadecan	544-76-3	36,30	TVOC	3	3	NIK 21000	0,000
Phenol...		39,61		21	21	ohne NIK	

German Approach in Source Control: AgBB Scheme for evaluation of product emissions

Basic principles:

1. to **limit the total amount** of emissions of volatile organic compounds
– **TVOC, TSVOC**
2. to **assess the toxicological relevance** of detected **single substances**
 - **LCI** Values
 - **Harmless substances**
 - **Carcinogens**
3. to **limit the non-assessable substances** (precautionary principle)

Fig. 1: FLOW CHART FOR SVOC*EMISSIONS FROM BUILDING PRODUCTS AND Consumer products labelling



Generally accepted methods for sensory tests expected to be performed at this stage have yet to be agreed upon.

* VOC, TVOC: Retention range C₆ – C₁₆; SVOC: Retention range C₁₆ – C₂₂

** LCI: Lowest Concentration of Interest (German: NIK)

European Emission Test Standard prEN ISO 16000-9 to -11

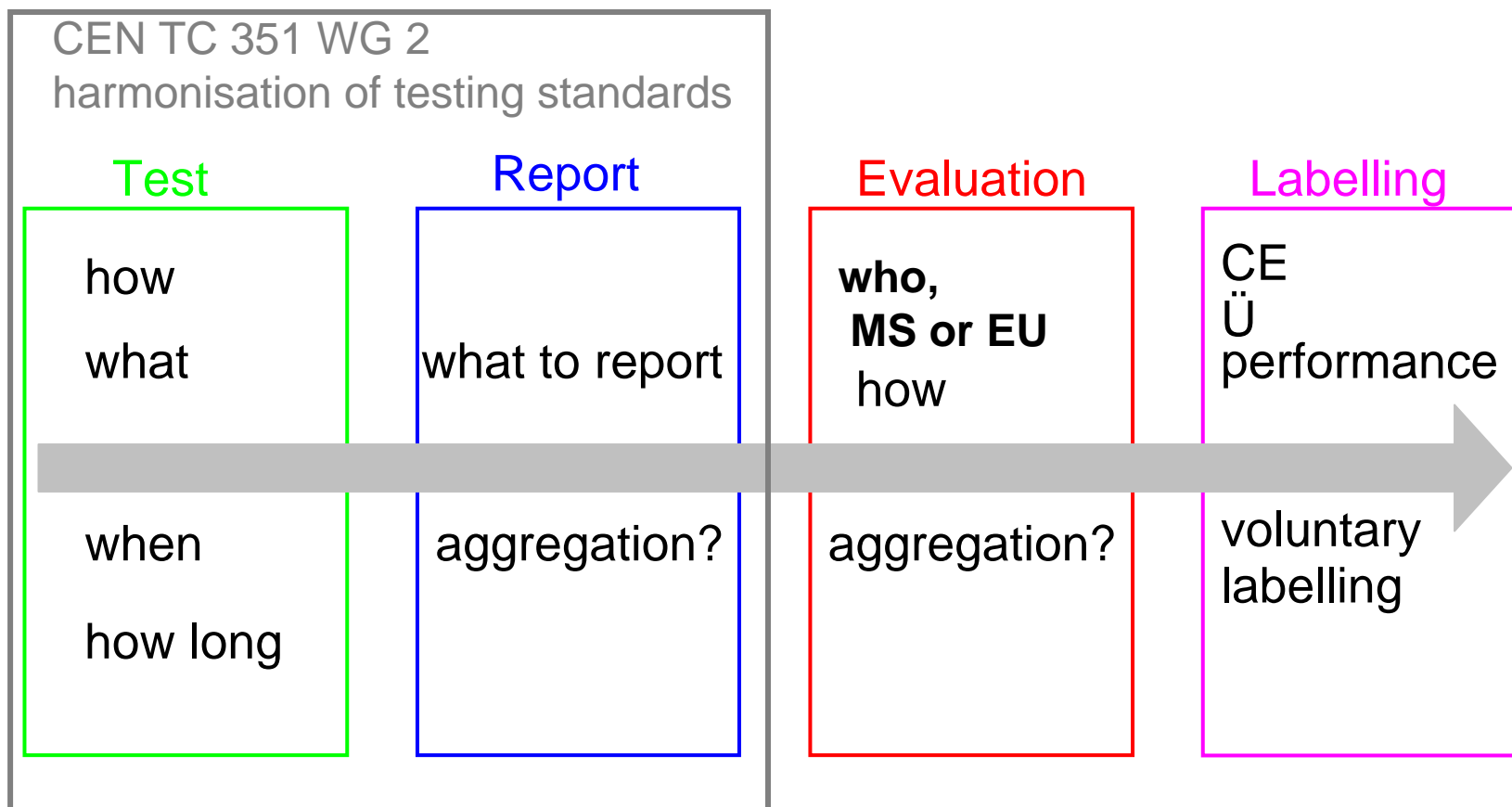
UBA II 1.3 - AgBB
Sept. 2006

History of AgBB implementation in D

- 1997: ECA 18 – ECA 18 – ECA 18....
- 2000: AgBB proposal of emission reduction for building products, two levels of quality requirement
- 2001: 1st Hearing with relevant stakeholders from industry's side, regulators, scientists, labs, NGOs
- 2002: on industry's request only one emission level in AgBB scheme for regulatory purposes
- 2002 – 2004 Introductory period with collection of testing experiences for a broad range of products
- 2004: 2nd Hearing
- 2005: AgBB scheme part of approval requirements by DIBt
 - **Notification in Brussels..**
- **2006: AgBB emission test mandatory for flooring materials**

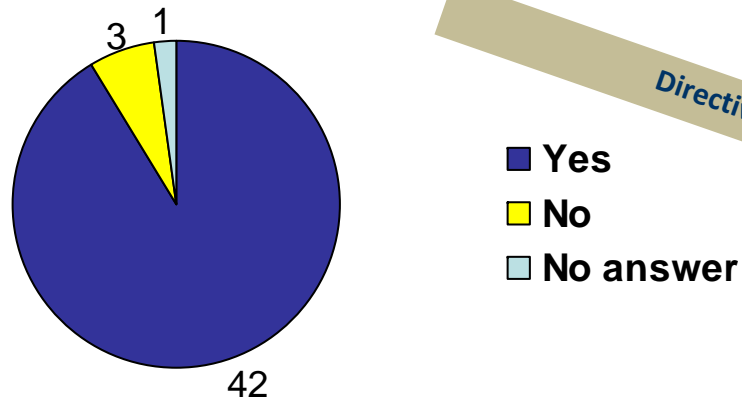
Cave: The USE is restricted, not the coming into the market!

From testing to labelling

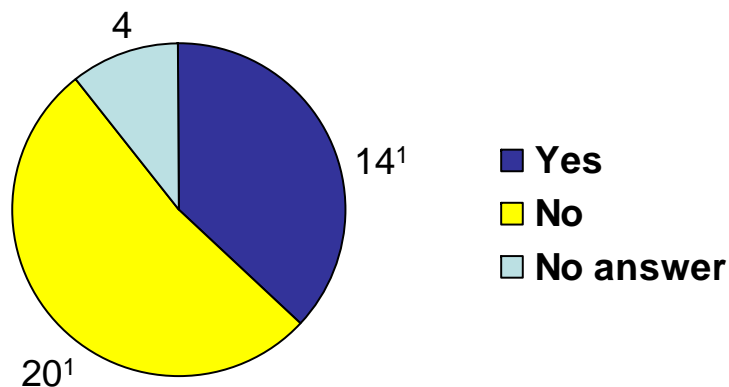


International Conference on Construction Products and IAQ: participants vote

- Would you recommend that the EC undertake to harmonise the health related evaluation of construction products in the EU?



- In your opinion, should preference be given to a non-regulatory control system?



¹⁾ Additional 8 persons were in favour of a smart combination of both approaches.

(Berlin, 2007)

Thank you for your attention

- www.umweltbundesamt.de/building-products/agbb.htm
- www.umweltbundesamt.de/gesundheit-e/irk.htm
- www.umweltbundesamt.de/survey/index.htm