

Für Mensch & Umwelt

Umwelt 
Bundesamt

Twinningproject: Support to the Israeli Ministry for Environmental Protection in improving and modernizing environmental regulatory and management tool for the Israeli industry –
Regulatory tolls for SMEs, Resource Efficiency, Eco-Management and Audit Scheme

Mission to Tel Aviv November/December 2016

Review of the TA Luft (Technical Instructions on Air Quality Control)

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Section III 2.1 / Cross-sectoral aspects of industry

Federal Environment Agency

DESSAU-ROßLAU

Overview

1. Relevance of the TA Luft?
2. Why was a revision considered necessary?
3. State of the review process and progress
4. Examples for proposed amendments in the TA Luft
5. Next steps

1. Relevance of the TA Luft?

THE CENTRAL IMMISSION PROTECTION ADMINISTRATIVE REGULATION FOR INSTALLATION SUBJECT TO LICENSING

- Norm-defining administrative regulation to the federal emission law, legally binding for authorities
- No.4 Requirements for the Protection against Harmful Effects on the Environment (= Immissions) and No. 5 Requirements to Provide Precautions against Harmful Effects on the Environment (= Emissions)
- Base for more than 50.000 installations
- Attains nationwide binding requirements for installations that are subject to permitting, thus equal treatment of comparable installations
- Conventions: flexible, eg by applying specific regulation to existing installations, dynamic clauses, aiming for minimisation and target values
- Necessary leeway (vs ordinances)
- Simplifies the permitting process for authorities and guarantees legal security and planning reliability

2. Why was a revision considered necessary (1)?

TA LUFT-HISTORY

- First publishing version of the TA Luft 1964 (under the Trade regulation)

Under Federal Emission Law:

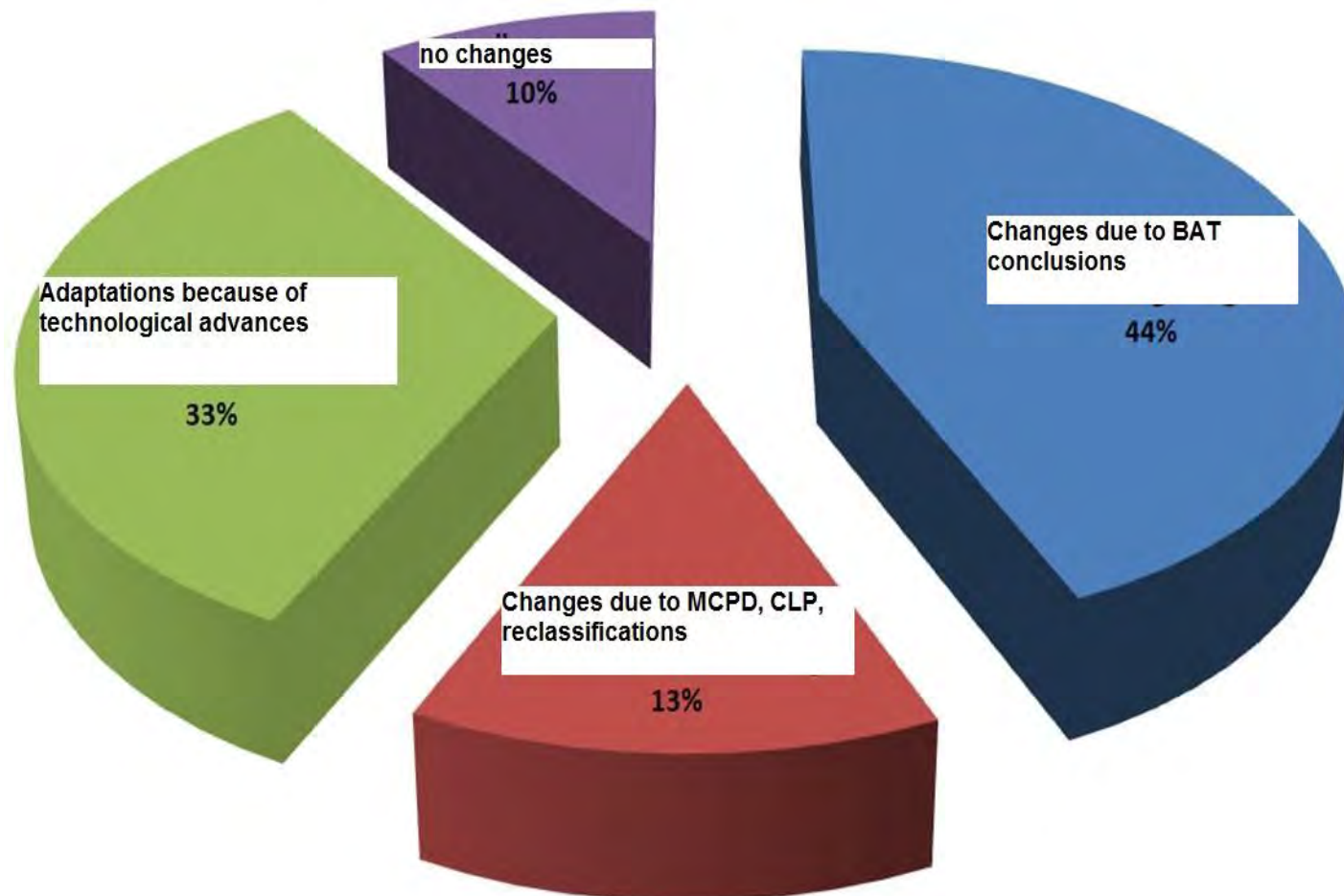
- 1974
- Reviewed 1986
- Comprehensive Review 2002

2. Why was a revision considered necessary (2)?

- **Implementation of conclusions of best available Techniques (BAT)**
- **Adaption to new regulations, eg. MCPD-RL, CLP (GHS), new classifications and classing of substances; NE(R)C-RL**
- **Other adaptations to the development of the state of the art**
 - ✓ All temporary regulations to existing plants (35) have expired
 - ✓ Integration of new executive recommendations from state level (LAI-expert group of representatives of the 16 state environment ministries and the federal env. ministry)
 - ✓ Adaptation to revised structure of the 4. ordinance including new types of installations, eg. Wood pellet plants, calendering plants or just special additional requirements, eg. plants for shredding
 - ✓ Necessary updates, correction, elaborations, complementations, in particular VDI Guidelines
 - ✓ Harmonisation with §34 Federal law on nature protection

2. Why was a revision considered necessary (3)?

Reason/ source of changes in TA Luft No. 5.4 Special regulation for certain types of installations (145 types of installations)



3. State of the review process and progress (1)

- 2012: First considerations to review the TA Luft, triggered by BAT
- 10/2012: Investigation and detailed report of UBA about what have to be reviewed the Ministry
- 3/2014: Decision by the Ministry of Environment to officially start the review of the TA Luft within the existing structure and system (adaptation versus review), principles: transparency and traceability
- Coordinated by BMUB and UBA, including input by federal states
- Newly formed German states team (BL AG) at BMUB, UBA, LAI-committee (AISV, LWV und RUV) (chairmanship BMUB)
- At UBA: lead management by III 2.1; Overall collaboration of about 50 colleagues

3. State of the review process and progress (2)

- 1. draft was send in 4 parts between May 2015 und July 2015
 - Since July more than 80 talks with industry, NGOs and federal state experts/colleagues
 - We held some expert meetings, eg. on reproductive toxic substances, industrial flares, combustion engines, determination of stack heights, rearing of poultry and pics, and the amendments in No. 4 (Immissions)
 - Some research projects have been realized, eg. for the determination of stack heights and for classification of carcinogenic substances
 - Incorporation of the results from the talks in a new draft → agreement of the ministry of env. September 2016 → publishing of the ministry draft from 9 September 2016 (appr. 400 pages) (plus 61 pages background information/justification)
- hearings of state ministries, industry and is scheduled for 5/6/7 December
- further interministerial discussion process

TA Luft– contents

1. Scope of Application
2. Definitions of Terms and Units of Measurement
3. General Principles for Granting a Permit, Provisional decisions and Permissions for early Start
4. Requirements to provide Protection against Harmful Effects on the Environment
5. Requirements to Provide Precautions against Harmful Effects on the Environment

5.1 *general information*

5.2 *general requirements for limiting emissions*

5.3 *measuring and monitoring of emissions*

5.4 *special provisions for certain types of installations*

5.5 *discharge of exhaust gases*

6. Subsequent orders (remediation of old installations)
7. Cancellation of Regulations
8. Entry into Force

appendixes : 1 – 13

4. Examples for prospective changes of the TA Luft (1)

No. 1 Scope of application

- Air (No. 4 (Prevention against harmful effects = Immissions) und No. 5 (Precaution against harmful effects - Emissions))
- Odour:
 - ✓ Prevention against harmful effects by odour emissions (disadvantages or nuisances) in No. 5 for new Installations by setting minimum distances and odorous substance concentration value
 - ✓ New: requirements on the prevention against harmful effects in No. 4.3.2 → GIRL (Odour exposure guidelines) (limitation of the frequency of perception)
- Requirements on Energy and Rawmaterials (→ 5.2.11)
- Consideration of nature protection: Protection of areas of common significance (Natura 2000 Gebiete (Fauna-Flora-Habitat-directive), control of atmospheric input of nitrogen and sulfur (pre-assessment in the permit procedure)

No. 2 Definition of terms/No. 2.2 Immission Indicators

- Additional load $\leftarrow \rightarrow$ Total additional load $\leftarrow \rightarrow$ total load $\leftarrow \rightarrow$ initial load (problem: irrelevance values)

4. Examples for prospective changes of the TA Luft (2)

No. 4.5.1 Immission values for pollutant deposition

- The requirements for the protection against harmful effects including the adverse soil alterations has been amended (Cr, B(a)P, PCDD/F are added and the values for Pb and As have been lowered)

No. 4.6.1.1 Determination within the permit procedure

- **Minor mass flows**, for which no determination of immission indicators are considered necessary, have been lowered, in some cases considerably
- Reason: The existing mass flows in table 7 can not be considered „minor mass flow“ according to the state of knowledge

No. 4.8 Determination in cases where no Immission values are established or in special cases

- Nitrogenloads and sulfurloads in FFH-areas (Annes 8 and 9)
- Bioaerosoles (Annex 10) (Guidance document of the LAI, April 2014)
- Residential areas?

4. Examples for prospective changes of the TA Luft (3)

National Transposition of TA Luft relevant BVT-conclusions with AEL (associated emissions levels):

- Until 2014 TA Luft committee/Ministry of environment/German Conference of Environment Ministers → **11 executive recommendations** → TA Luft review
<http://www.lai-immissionsschutz.de/servlet/is/26513/>
- Since early 2014: **general sectoral administrative regulations by the Federal Environment Minister** (according to § 48 Federal Immission Control Act) → TA Luft review
 - ✓ Chlor-Alkali-Elektrolysis http://www.verwaltungsvorschriften-im-internet.de/bsvwvbund_01122014_IGI25013931.htm
 - ✓ Pulp and Paper and Refining of Mineral Oil and Gas are in the legislative procedure (13th ordinance has to be amended too)

No. 5.1 Requirements to provide precaution against harmful effects – General –

Content and meaning

- Transposition of BAT-conclusions into German regulation/law and expression that the new **single general administrative regulations** have priority to the TA Luft (problematic: transposition deadline is one year by law)
- Derogations according to Article 15 (4) due to technical characteristics are possible by case to case examinations, substantiated reasoning and reporting obligations

4. Examples for prospective changes of the TA Luft (4)

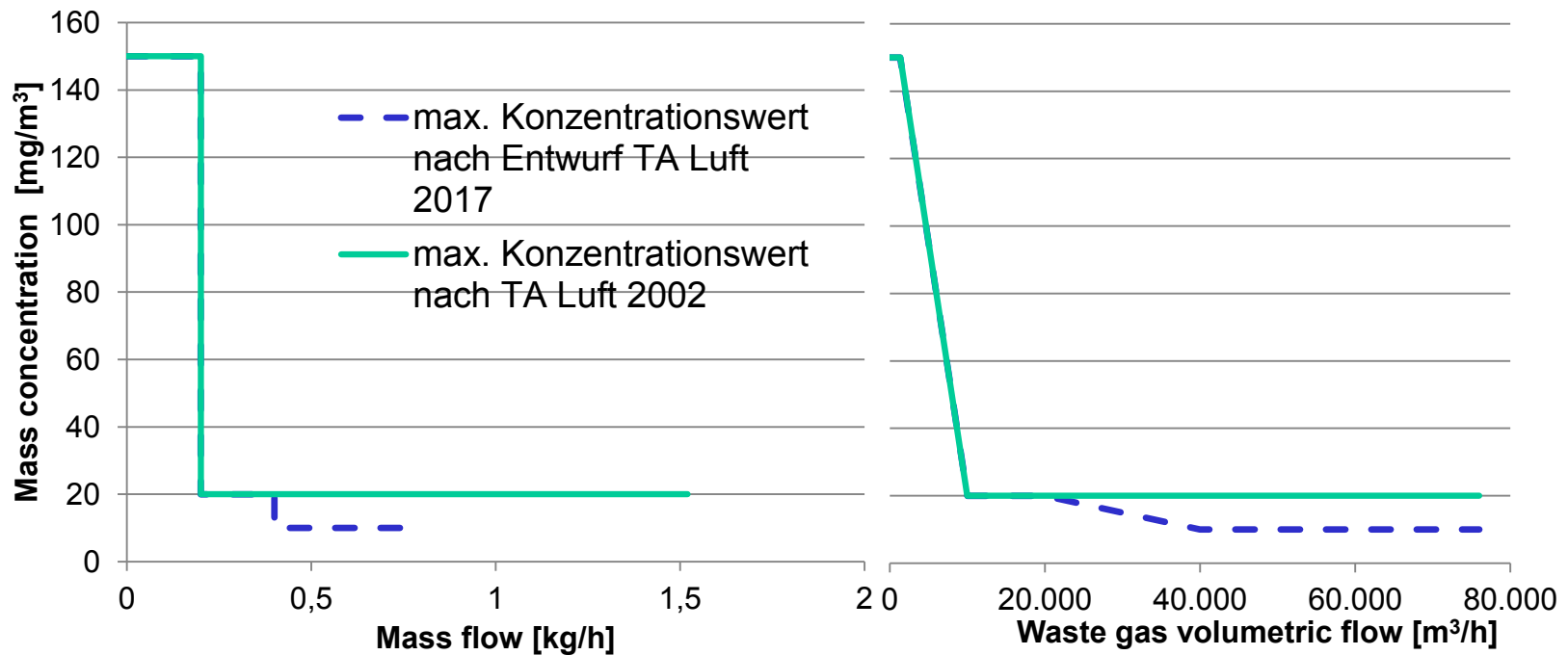
No. 5.2 General requirements to emissions values

No. 5.2.1 Total dust, ~~including fine dust~~

- Mass flow $< 0,20$ kg/h and $< 0,15$ g/m³ or mass concentration value < 20 mg/m³
- **New:** additional for single emissions sources with a mass flow $> 0,40$ kg/h \rightarrow concentration value < 10 mg/m³

4. Examples for prospective changes of the TA Luft (5)

No. 5.2.1 Total dust, ~~including fine dust~~



4. Examples for prospective changes of the TA Luft (6)

No. 5.2.2 Inorganic particulate Matter

Class I

- **Mercury** and its compounds, to be indicated as Hg
- Thallium and its compounds, to be indicated as Tl

mass flow per substance ~~0,25~~ **0,05** g/h

or

mass concentration per substance ~~0,05~~ **0,01** mg/m³

Exceptions for mercury in the special provisions for certain types of installations (No. 5.4ff.):

- ✓ No. 5.4.1.2.1b: existing combustion plants for lignite : < 20 MW 0,02 mg/m³ (0,04 domestic lignite); > 20 MW 0,01 mg/m³ (0,02 bei domestic lignite)
- ✓ No. 5.4.2.3 cement plant: 0,03 mg/m³, bis 0,05 due to raw material content
- ✓ No. 5.4.3.1a sinter plants: 0,03 mg/m³ for existing plants with electrostatic precipitator
- ✓ No. 5.4.3.3a sekundary copper: 0,02 mg/m³
- ✓ No. 5.4.8.3.1 Waelz-kilns for EAF dust treatment: 0,05 mg/m³

4. Examples for prospective changes of the TA Luft (7)

No. 5.2.2 Inorganic particulate Matter

No. 5.2.5 Organic Substances

No. 5.2.7.1 carcinogenic, germ cell mutagenic or reproduction toxic substances

- Implementation of the CLP ordinance (EG) No. 1272/2008, (*Basis: GHS of the UN*)

General amendments in No. 5.2.2, No. 5.2.5 and No. 5.2.7.1:

- ✓ Terms (Zubereitung → mixture (Gemische), carcinogenic (krebserzeugend → karzinogen), germ cell mutagenic (erbgutverändernd → keimzellmutagen)
- ✓ Hazard statements (Gefahrenhinweise): R-statements become H-statements
- ✓ Def.: Substances classified by CLP regulation, TRGS 905 or TRGS 906 are CMR-substances

No. 5.2.5 Organic Substances:

- ✓ Formaldehyde → No. 5.2.7.1.1 (carcinogenic substances); 11 more substances classified as CMR
- ✓ Transformation of hazard categories toxic/very toxic → Acute Tox. 1, 2 and 3
- ✓ Octamethylcyclotetrasiloxane, 1-Brom-3-Chlorpropane and 1-3-5-Trioxane from class II → class I (substances suspected to have CMR-potential for humans)

4. Examples for prospective changes of the TA Luft (8)

No. 5.2.7.1.1 Carcinogenic Substances

UBA-Research project 2014/2015:

<http://www.umweltbundesamt.de/publikationen/bewertungen-fuer-die-ta-luft-nr-52711>

- Examination and re-assessment of new and existing classifications, e.g. Benzene class III → class II
- Some new assignments, e.g. Beryllium (class I), Quartz PM 4 (class II)
- Formaldehyde (particular case)

(cross class requirements as before)

class I: As, BaP, Cd, Co, Cr(VI) , New: Be, Furan, Hydrazine, Trichlortoluole

$Q \leq 0,15 \text{ g/h}$ or $c \leq 0,05 \text{ mg/m}^3$

class II: Ni, Bencene, o-Toluidine, Quartz... (overall 15 substances)

$Q \leq 1,5 \text{ g/h}$ or $c \leq 0,5 \text{ mg/m}^3$

class III: Bencene, ~~o-Toluidine~~, New: Epichlorhydrin, Isobutylnitrite, (overall 9 substances)

$Q \leq 2,5 \text{ g/h}$ or $c \leq 1 \text{ mg/m}^3$

4. Examples for prospective changes of the TA Luft (9)

No. 5.2.7.1.1 Carcinogenic Substances

here: **Formaldehyde (particular case)**

- Starting point: Proposal by the ECHA and agreement of the EU Commission to classify Formaldehyd in the CLP regulation → Formaldehyd Hazard category Carc. 1B (H350)
- TA Luft: → re-classification of Formaldehyde: No. 5.2.5 in No. 5.2.7.1.1! Class?
- Particular case: Assumption of an effect threshold value by experts (AGS)
 - ✓ LAI executive recommendation for Formaldehyde <http://www.lai-immissionsschutz.de/servlet/is/20172/>
 - ✓ TA Luft → No. 5.2.7.1.1: not within the class system; $c = 5 \text{ mg/m}^3$ und mass flow = 12,5 g/h
 - ✓ Additional 20 special provisions in No. 5.4.ff: combustion engines, glass, mineral fibres, resin production, surface treatment plants, pulp and paper production, wood based panels, roasting coffee, refining of sugar (dryers), drying green fodder, roasting ovens, vulcanising natural and synthetic rubber, test stands for combustion engines, textile finishing (generally $5 - 20 \text{ mg/m}^3$)

4. Examples for prospective changes of the TA Luft (10)

No. 5.2.7.1.1 Carcinogenic Substances

here: Quartz

- Starting point: 2002 AGS/IARC: Siliciumdioxide, crystalline (PM 4), species Cristobalite und Quartz cause cancer (Carc. 1A)
 - ✓ No. 5.2.7.1.1: Quartz (PM4) → class II → 0,5 mg/m³
 - ✓ For all types of installations it is considered to be sufficient to measure and comply with the dust requirements to proof to comply with the requiremnts on quartz (facilitation)

Exception:

- ✓ No. 5.4.2.1/5.4.2.2 Quarries and plants for treatment of rocks and stones (crushing, drying, grinding, grading)
- ✓ Quartz PM 4 → 1 mg/m³
- ✓ Quartz PM 4-measurements shall take place for stone grinding plants

4. Examples for prospective changes of the TA Luft (11)

No. 5.2.7.1.2 Germ cell mutagenic Substances

- Currently: 0,15 g/h or 0,05 mg/m³ as a **target value** (carcinogenic properties prevails)
- **New: 0,05 mg/m³ shall not be exceeded (LAI-LWV-UAK)**

4. Examples for prospective changes of the TA Luft (12)

No. 5.2.7.1.3 Reproduction toxic Substances

- **Currently: Limitation according to the hazard potential**
→ Industry talks → reassessment needed → Expert meeting 13 April 2016
- **Result: 2,5 g/h or 1 mg/m³** (germ cell mutagenic or carcinogenic properties prevails)
- E.g for the production of coated winding wires or calendering plants (PVC-hartfoils)

Exceptions for reproduction toxic Substances in the special provisions for certain types of installations:

- ✓ 5.4.2.8.1e/2e: Spezial glass and 5.4.2.8.1f/2f: Glass wool: does not apply for Bor; minimisation obligation only
- ✓ 5.4.4.1.8d: Polyacrylnitril fibres: Spinning machines and follow-up-treatment 4 mg/m³;
- ✓ Drying process 10 mg/m³

4. Examples for prospective changes of the TA Luft (13)

No. 5.2.7.2 Slowly degradable, highly accumulative and highly toxic organic substances

Dioxins and Furans → Dioxins, Furans and Polychlorinated Biphenyls (PCB)

Sum of Dioxins, Furans and PCBs (WHO):

mass flow $Q \leq 0,25 \mu\text{g}/\text{h}$ or mass concentration $c \leq 0,1 \text{ ng TE}/\text{m}^3$

New:

- ✓ To be considered are polychlorinated biphenyls (4 non ortho PCB + 8 mono ortho PCB) (WHO) (see also Annex 4: **equivalence factors** for Dioxins, Furans and polychlorinated Biphenyls)
- ✓ Special provisions in No. 5.4ff., e.g. for non-ferrous metals and sinterplants

4. Examples for prospective changes of the TA Luft (14)

No. 5.2.9 Bioaerosols

- **Currently: Requirements in No. 5.4.7.1, 5.4.7.15, 5.4.8.5 and 5.4.8.6 der TA Luft:**

„Germs: The possibilities to reduce emissions of germs and endotoxins by state of the art techniques **shall be examined.**“
- **New:** Relocated from special provisions section No. 5.4ff. to the general requirements to emission limits → No. 5.2.9 Bioaerosols
- **If Bioaerosols are likely to be emitted requirements according to the state of the art shall be applied:**
 - ✓ relevant plants, i.e. No. 7.1, 7.15, 8.5 and 8.6 according to the list in annex 1 of the 4th ordinance to the Federal immission control act and VDI 4255 Bl.1 or guidelines 2014 of a Federal working group on Immission protection)
 - ✓ Including stationary evaporation coolers and natural draft cooling towers or wet scrubbers (Legionella)

4. Examples for prospective changes of the TA Luft (15)

No. 5.2.11 Energy and raw materials

No. 5.2.11.1 General

No. 5.2.11.2 Measures to reduce energy consumption including electrical energy and for an efficient energy use

No. 5.2.11.3 Measures to reduce raw material consumption and appropriate handling of residues

In No. 5.2.11 21 general measures are included to describe how thermal and electrical energy can be used, how raw material consumption can be reduced and how residues should be treated in order to maximize reuse and recycling.

- **Starting point:** transposition of BAT-conclusions for energy and rawmaterial consumption which do not have a BAT-AEL
- **The problem here is:**
 - ✓ **Article 14 (3) „reference only“**
 - ✓ **Scope of application of the TA Luft („...protection against harmful effects of air pollution...“ → Trick:** any reduction of energy and raw material has the additional benefit to reduce direct and indirect emissions
 - ✓ **For plants among the Emission Trading Law the restriction given by § 5 paragraph 2 BImSchG have to be respected („barring clause“)**

4. Examples for prospective changes of the TA Luft (16)

No. 5.3 Measurement and monitoring of emissions

No. 5.3.2 Individual measurements

- ✓ Basically every three years
- ✓ Yearly measurements for IED-installations, excluded odour measurements
- ✓ More frequently measurements are possible according to BAT conclusions → No. 5.4 (e.g. glass or wood based pannels)
- ✓ In case prerequisites for technical qualification are given measurements can be conducted by the company itself

4. Examples for prospective changes of the TA Luft (17)

No. 5.4 Special provisions for certain types of installations

- **EXAMPLES FOR CONSIDERABLY AMENDED SPECIAL PROVISIONS**

- ✓ 5.4.1.2/1.4 Combustion plants
- ✓ 5.4.2.1, 5.4.2.2 Quarries and plants for treatment of rocks and stones
- ✓ 5.4.2.8 Glassproduction
- ✓ 5.4.2.11 Mineral fibre manufacturing
- ✓ 5.4.3.1 und 5.4.3.2 Iron and steel production
- ✓ 5.4.3.3 und 3.4 Non Ferrous metals production
- ✓ 5.4.3.7/8 Foundries
- ✓ 5.4.6.3 Production of wood based panels
- ✓ 5.4.6.4 Wood pellets production
- ✓ 5.4.7.1 Rearing of poultry and pigs
- ✓ 5.4.8.5 Compost works
- ✓ 5.4.8.6.2 Fermentation plant for bio-waste
- ✓ 5.4.8.9.1 Shredder plant
- ✓ 5.4.8.10c/11c Disposal and treatment plant for refrigerators

4. Examples for prospective changes of the TA Luft (18)

General structure of No. 5.4

- ✓ Minimum distance to next residential area (dispersion modeling + GIRL)
- ✓ Reference parameter (e.g. reference oxygen content)
- ✓ Constructional and operational requirements (e.g. storage of raw materials, storage areas, waste gas collection, housing or enclosure requirements)
- ✓ Measuring and monitoring (e.g. average determination, determination of relevant pollutants, continuous measurements, single measurement frequency)
- ✓ Defining differences to the requirements in No. 5.2 (e.g. pollutants, exclusion of mass stream, minimisations obligation, dynamic clauses)
- ✓ Exceptions for existing plants, temporary or unlimited requirements
- ✓ NEU: transition and temporary requirements related to BAT

4. Examples for prospective changes of the TA Luft (19)

No. 5.4 Special provisions for certain types of installations

- Transposition of BAT conclusions into national regulations:
 - ✓ **General no setback**
 - ✓ Usually the upper end of the BAT-AEL range is used for the recommendations or administrative regulations
 - ✓ Deviations from the upper BAT-AEL value only in well-justified cases

4. Examples for prospective changes of the TA Luft (20)

Example: BREF Iron and steel production /No. 5.4.3.1a Sinterplant

Pollutant	BAT/ Range BAT-AEL [mg/m ³]	Current TA LUFT [mg/m ³]	New requirements [mg/m ³]
Dust (BVT 20)	1 – 15 (Fabric filter) < 20 – 40 (Electrostatic Precipitator)	20 50 for existing plants with Electrostatic Precipitator	10 New plants; existing plants: 10 (from 2020) 40 (from 2016)
Dioxines/Furanes/ PCB (BVT 25)	0,05 – 0,2 ng/m ³ (Fabric filter) <0,2 – 0,4 ng/m ³ (Electrostatic Precipitator)	0,4 ng/m ³ Target value: 0,1 ng/m ³	0,2 ng/m ³ Target value: 0,1 ng/m ³ existing plants: 0,2 (from 2020), until then 0,4 ng/m ³

- ✓ This is an example for an ambitious national transposition
- ✓ Before **unlimited requirements for** existing plants with high values for Electrostatic Precipitators; Now: complete exchange of the abatement technique leads to tremendous reduction of all emissions, e.g. dust and dust bearing pollutants

4. Examples for prospective changes of the TA Luft (21)

Example: BREF Iron and steel production /No. 5.4.3.1a Sinterplant

Total emissions of dust and dust containing pollutants after retrofitting of electrostatic precipitators by fabric filters in Germany (2020 the latest)

Pollutant	Emissions [t/a]		
	TA Luft 2002	TA Luft 2017	Realistically estimated emissions with fabric filter
Dust	2900	580	200
Lead	116	58	20
Cadmium	29	17	<10
Mercury	29	17	<10
Dioxines/Furanes /PCBs [g/a]	3	1,5	<1

Based on production data according to the Iron nad steel BREF 2012

4. Examples for prospective changes of the TA Luft (22)

Example 5.4.7.1 Rearing or breeding of livestock (1):

Starting point:

- Transposition of BAT (comparatively weak requirements)
- German national emission ceiling (NEC directive): increase of the ammonia emissions from 550 kt/a (reference year 2016) to > 700 kt/a → Emission reduction needed >> 30%

Special provisions in No. 5.4.7.1:

Constructional and operational requirements:

- E.g. Disposal and storage of dung, manure and slurry, e.g. coverage to achieve 90% reduction efficiency (85% for existing plants); required efficiency TA Luft 2002: 80%
- demand optimised multi-phase-feeding
 - ✓ Limitation of nutrient excretion (N and P)
 - ✓ Documentaion and mass balance (see annex 11)
 - ✓ Ammonia emission reduction > 20 %
- **IED-installations:** air cleaning systems for new plants for pics and poultry
 - ✓ dust, ammonia and odour: mitigation efficiency > 70 %
 - ✓ Odorous substances concentration limit: 300 Odour units/m³

4. Examples for prospective changes of the TA Luft (23)

Example 5.4.7.1 Rearing or breeding of livestock (2):

Other than IED-installations: ammonia reduction efficiency > 40% related to the reference value; in particular by structural and operational measures, including partial waste gas abatement using air cleaning systems (see annex 12)

existing plants:

- Existing IED-plants shall apply air cleaning systems within 5 years, in closed plants if a forced ventilation system exists or can be retrofitted considering the principle of proportionality
- If air cleaning systems are considered disproportional and for other than IED-plants: ammonia reduction of > 40 % shall be achieved by single or combined measures according to annex 12
- **The animal welfare prevails**

→ Estimation of the overall ammonia reduction potential:

If all measures are applied an overall ammonia reduction of approx. 30 % can be achieved.

4. Examples for prospective changes of the TA Luft (24)

No. 5.5: Discharge of waste gas

Currently: Determination of the stack height with the Nomogramm (No. 5.5.3) with consideration of:

- ✓ Consideration of buildings, vegetation and shape of the terrain
- ✓ Minimum stack height 10 m and 3 m above the ridge of the roof
- ✓ Consideration of the slope of the roof; use of 20° in cases of a slope of less than 20° , however, max. is twice the height of the building
- ✓ $H_{\max} < 250 \text{ m}$; (200 m)



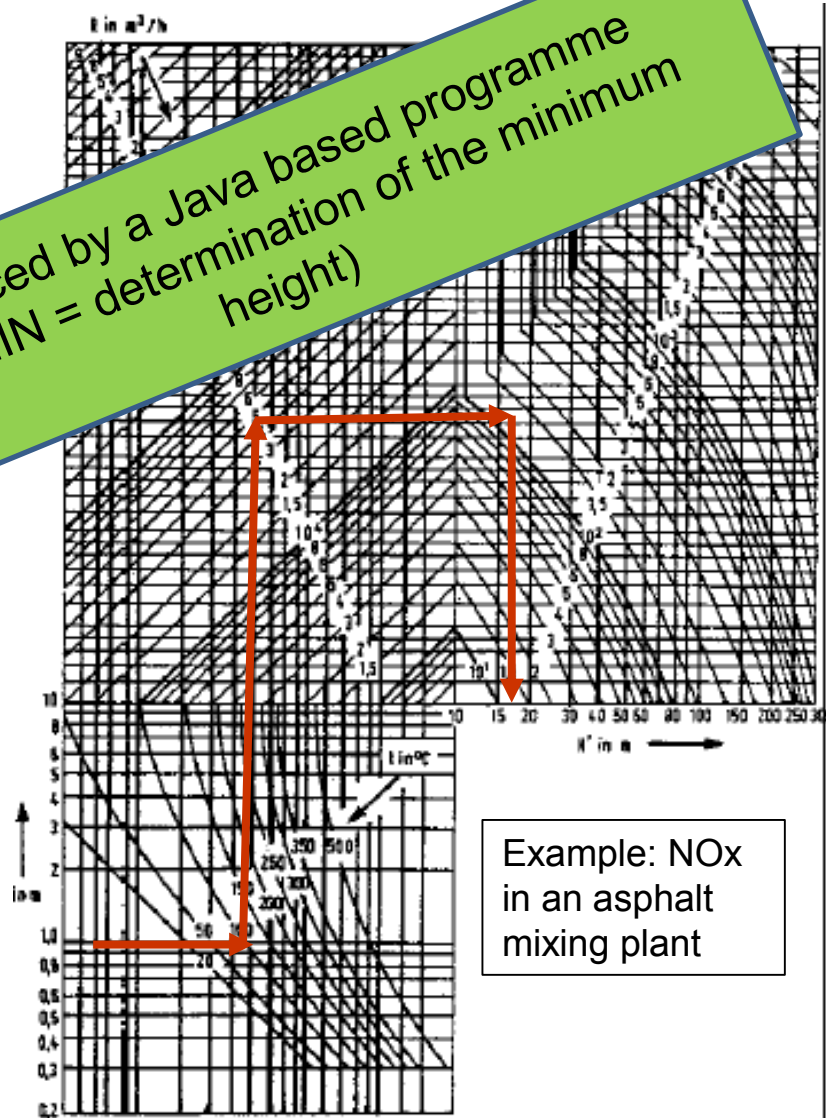
4. Examples for prospective changes of the TA Luft (25)

No. 5.5.3 Nomogramm for the determination of the stack height

H' in m	Stackheight in the Nomogramm;
d in m	Inner diameter
t in °C	waste gas temperature stack exhaust
R in m ³ /h	Waste gas volumetric flow (m ³ _{n.t} /h)
Q in kg/h	Mass flow (also for fibres)
S	Factor (currently no dimension) (Annex 7)

Determining for the stack height is the pollutant with the highest proportion of Q/S

Replaced by a Java based programme
(BESMIN = determination of the minimum height)



Example: NOx
in an asphalt
mixing plant

4. Examples for prospective changes of the TA Luft (26)

No. 5.5: Discharge of waste gas

Principles/ undefined legal term

DRAFT TA LUFT 2016

5.5.1 General

(1) Waste gases shall be discharged in such a manner that an undisturbed dispersion is made possible by the free air stream and a **sufficient dilution** will be achieved. As a rule, a discharge through stacks is required, the height of which shall be determined pursuant to No. 5.5.2, notwithstanding better cognition.

Both principles are mentioned

5.5.2 Discharge through stacks

5.5.2.1 General

(1) The position and the height of the stack exhaust has to comply with the requirements of the Guideline **VDI 3781 Blatt 4** (Draft, published December 2015), **to ensure an undisturbed dispersion by the free air stream.**

New: Prominent and extensive complete und umfassende determination of the so far undefined legal term: „undisturbed dispersion = ungestörter Abtransport“.

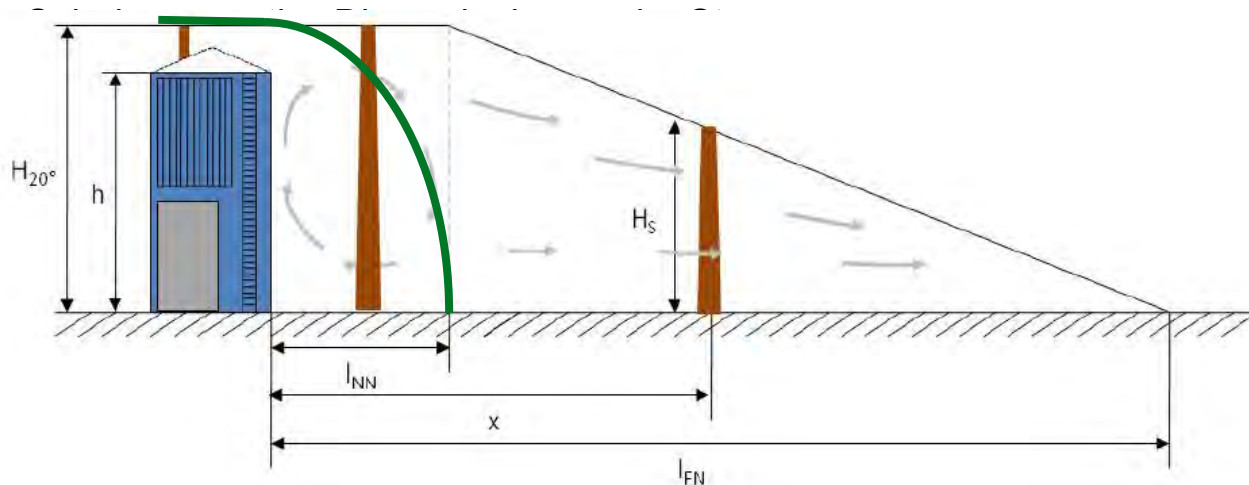
4. Examples for prospective changes of the TA Luft (27)

No. 5.5: Discharge of waste gas

No. 5.5.1 General: **Undisturbed dispersion by the free air stream**

No. 5.5.2 Discharge through stacks

CONSULTATIVE DOKUMENT (FEDERAL STATES COMMITTEE) STACKHEIGHT -DETERMINATION



The TA Luft 2002 defines the undisturbed dispersion with the free air stream only rudimentary (20°-rule in No. 5.5.2.1 second paragraph for flat roofs).

Consultative document "stack-height determination" of the LAI-AISV/LWV to describe the influence of high standalone buildings closures the gap

No. 5.5.2.1 General: Position of the stack exhaust

VDI 3781 BLATT 4 (REVIEW), DRAFT TA LUFT

- Aiming to give a more realistic estimation for the dimension of the disturbance zone

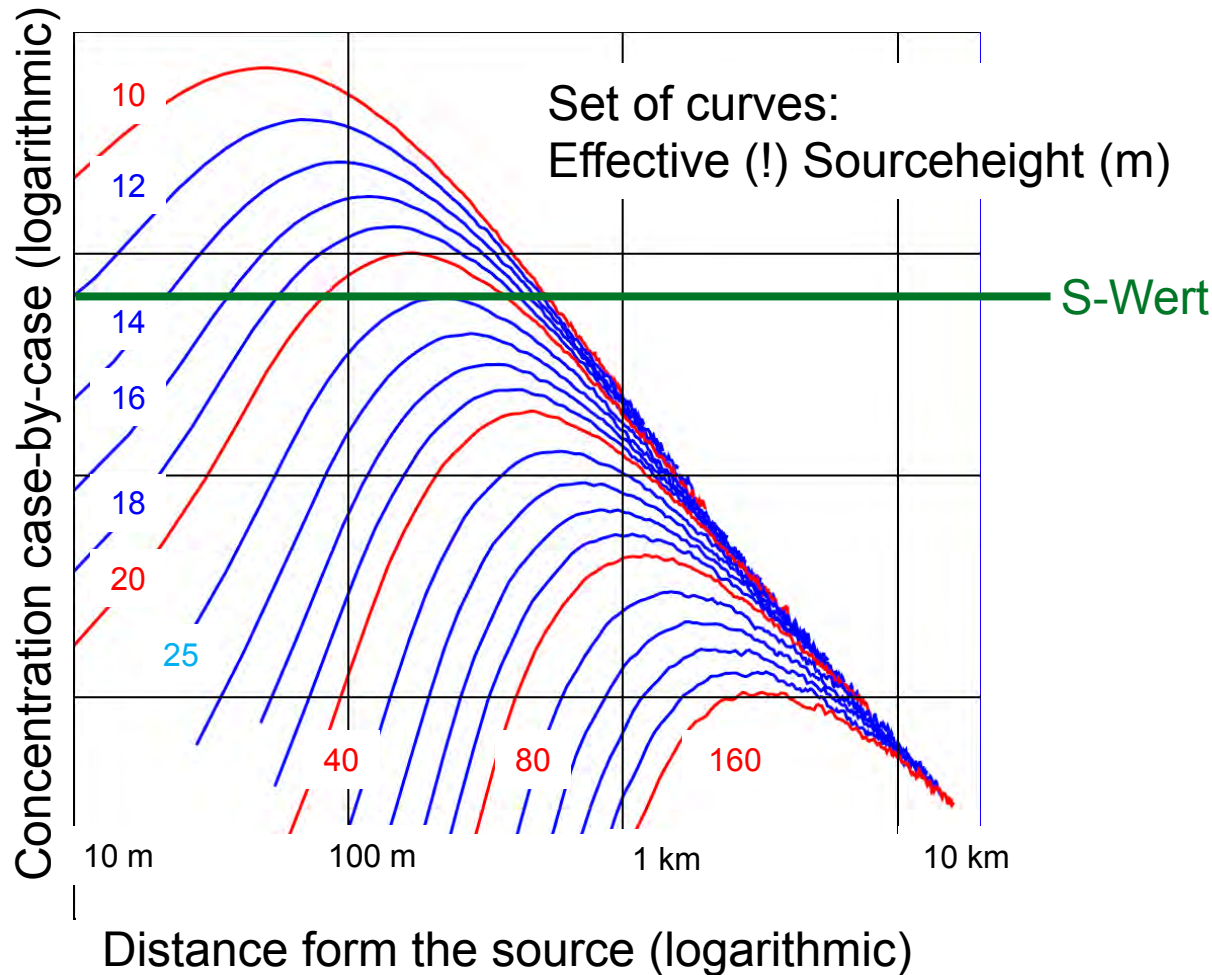
VDI 3781 Blatt 4 (Review) including additional requirements for different roof shapes.

4. Examples for prospective changes of the TA Luft (28)

No. 5.5: Discharge of waste gas

No. 5.5.1 General: sufficient dilution

No. 5.5.2.2 Determination of the stack height, Annex 2, section 14 (BESMIN)



Boundary layer model LASAT
Roughness length 0,5 m
Dispersion class III/1
Wind velocity 2 m/s

Draft TA Luft 9.9.2016:

calculated set of curves for

- 9 wind velocity classes (1 m/s – 12 m/s)
- 4 dispersion classes (I, II, III/1, III/2)
- 25 possible combinations
- the highest additional load applies

→ Determination of effective source heights, here → 25 m

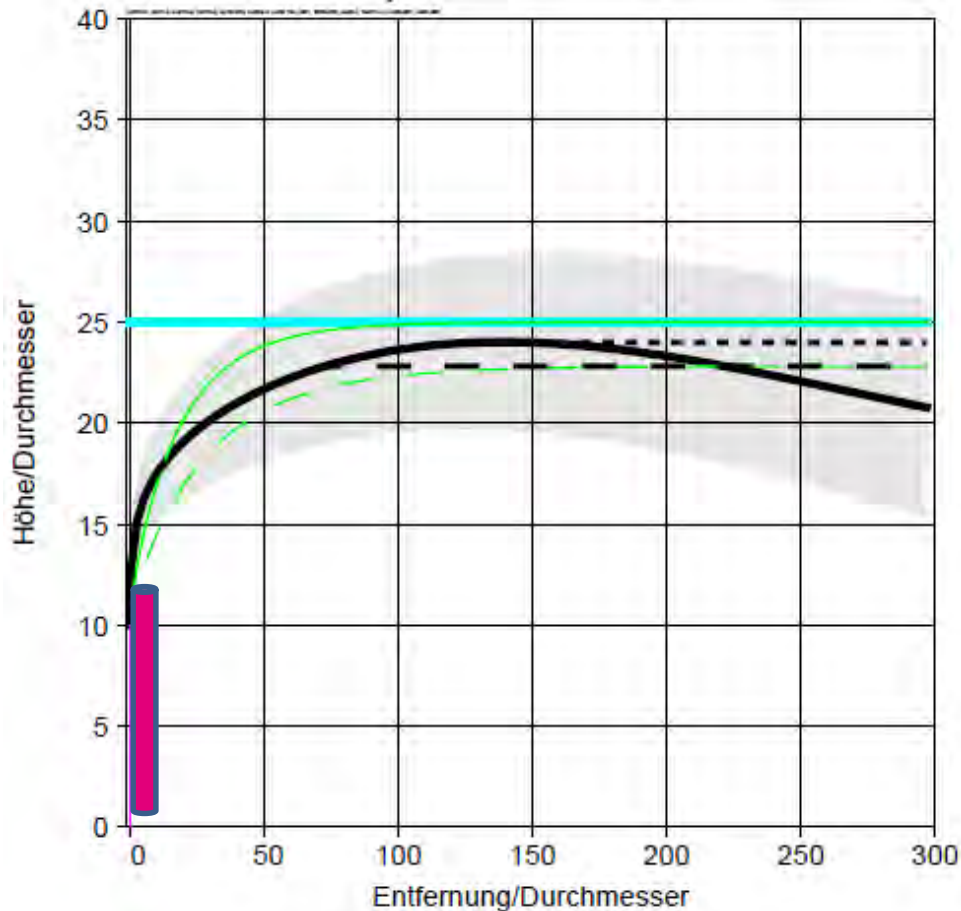
4. Examples for prospective changes of the TA Luft (29)

No. 5.5: Discharge of waste gas

No. 5.5.1 General: Sufficient dilution

No. 5.5.2.2 Determination of the stack height, Annex 2, Abschnitt 14 (BESMIN)

Effective sourceheight (jet impulse, stabile atmospheric layering)



Effective Sourceheight



Waste gas plume elevation

Stackheight

4. Examples for prospective changes of the TA Luft (30)

No. 5.5: Discharge of waste gas

New: No. 5.5.2.2 : Algorithm replaces Nomograph: Implementation as a Java-Programme (BESMIN=Determination of minimum stack height) (will be provided cost free by UBA)

1 DETERMINATION OF THE EFFECTIVE SOURCEHEIGHT

- Effective sourceheight, to ensure that the S-value (Immission value) is met; **the S value gets back its unit [mg/m³] and is impact related**

2 DETERMINATION OF THE WASTE GAS PLUME ELEVATION

- Inputdata: inner stackdiameter, waste gas velocity, waste gastemperature, waste gas humidity, windvelocity in the related area

3 DETERMINATION OF THE STACK HEIGHT

- Difference between the effective sourceheight and waste gas plume elevation gives the final stack height

5. Next steps

- Official hearings of the involved parties according to Art. 51 BImSchG (5/6/7 December 2016)
- further interministerial discussion process
- Cabinet draft → Cabinet decision and draft of the federal government
- → Federal Council process
- Goal: New TA Luft by Sommer 2017



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