



# PM abatement from a European perspective – current legislation and the CAFE thematic strategy

- Current legislation
- Plans and programmes
- CAFE
- Recommendations PM group
- Upcoming legislation



Ultrafeinstaub

Dresden, 24./24.10.2007



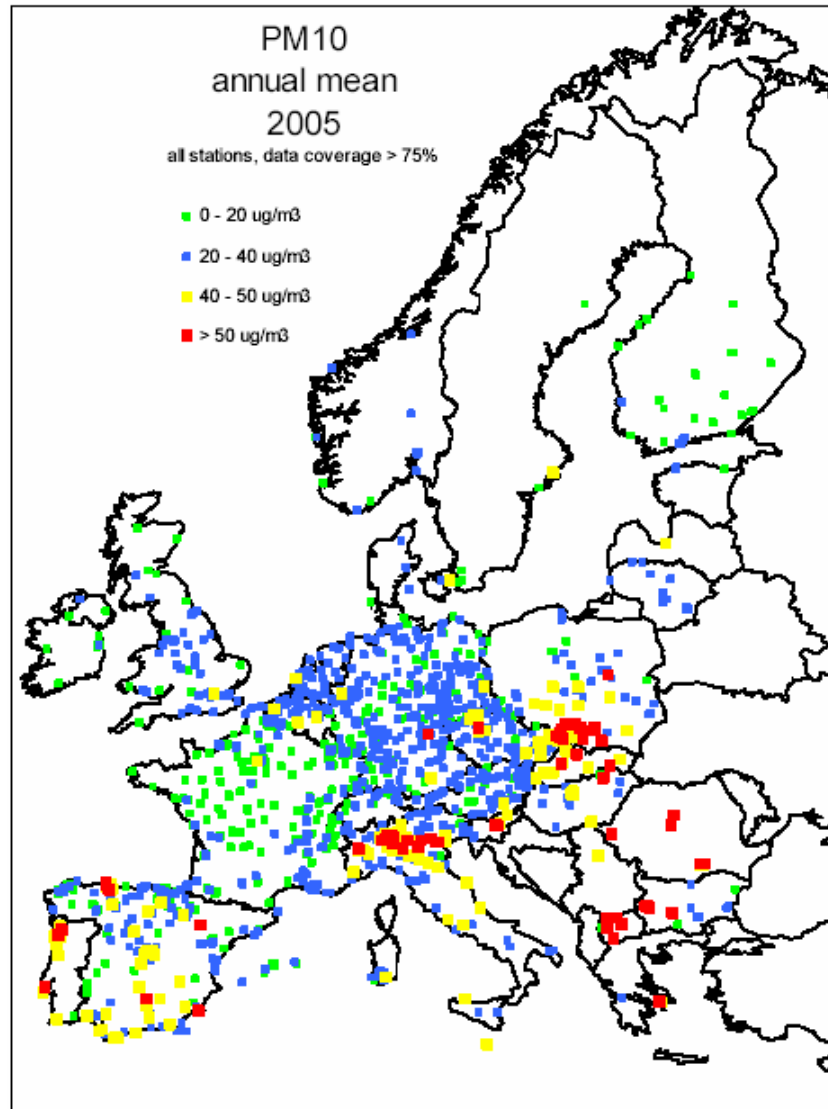
# **Requirements, when limit values are exceeded**

- Action plans with measures to be taken in the short term (Art. 7 FWD)
- Plans and programmes before attainment date (Art. 8 FWD)
- Measures beyond BAT in licence procedure, if necessary (Art. 10 IPPC)

# **Requirements in respect to other PM metrics**

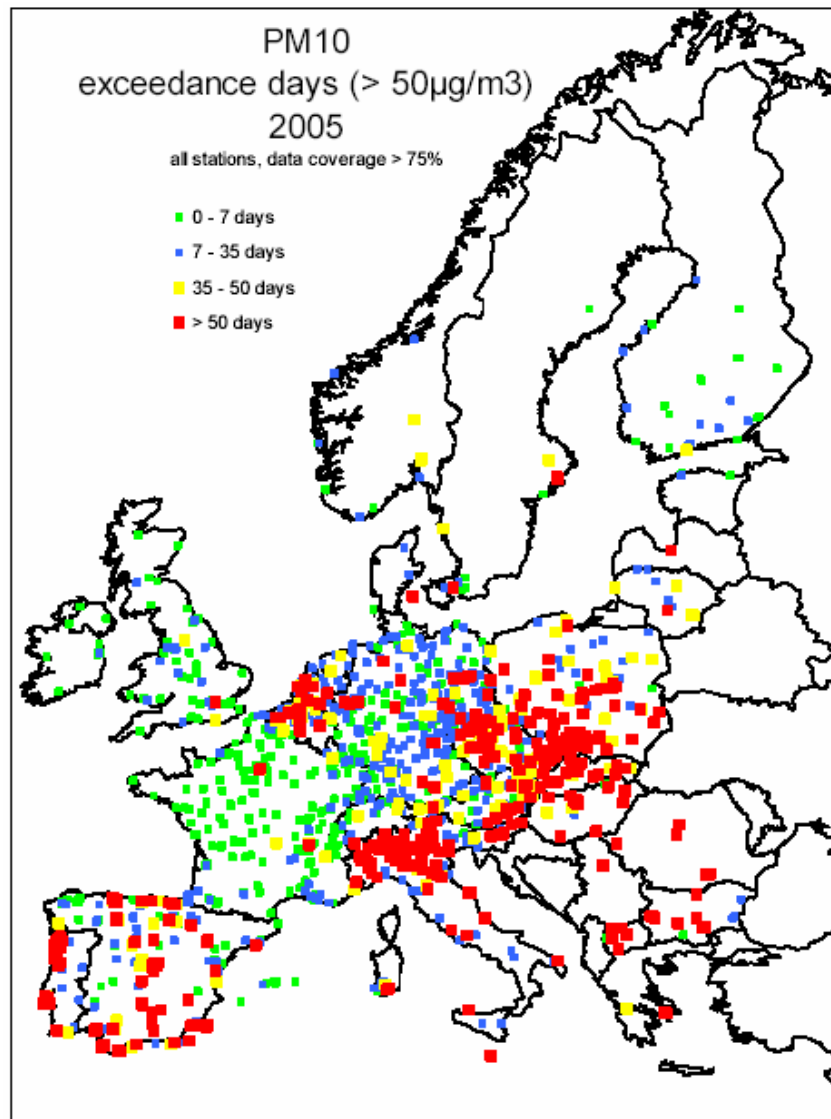
- Monitoring of PM<sub>2.5</sub> concentrations representative for Member State
- Action plans shall also aim at reducing PM<sub>2.5</sub>





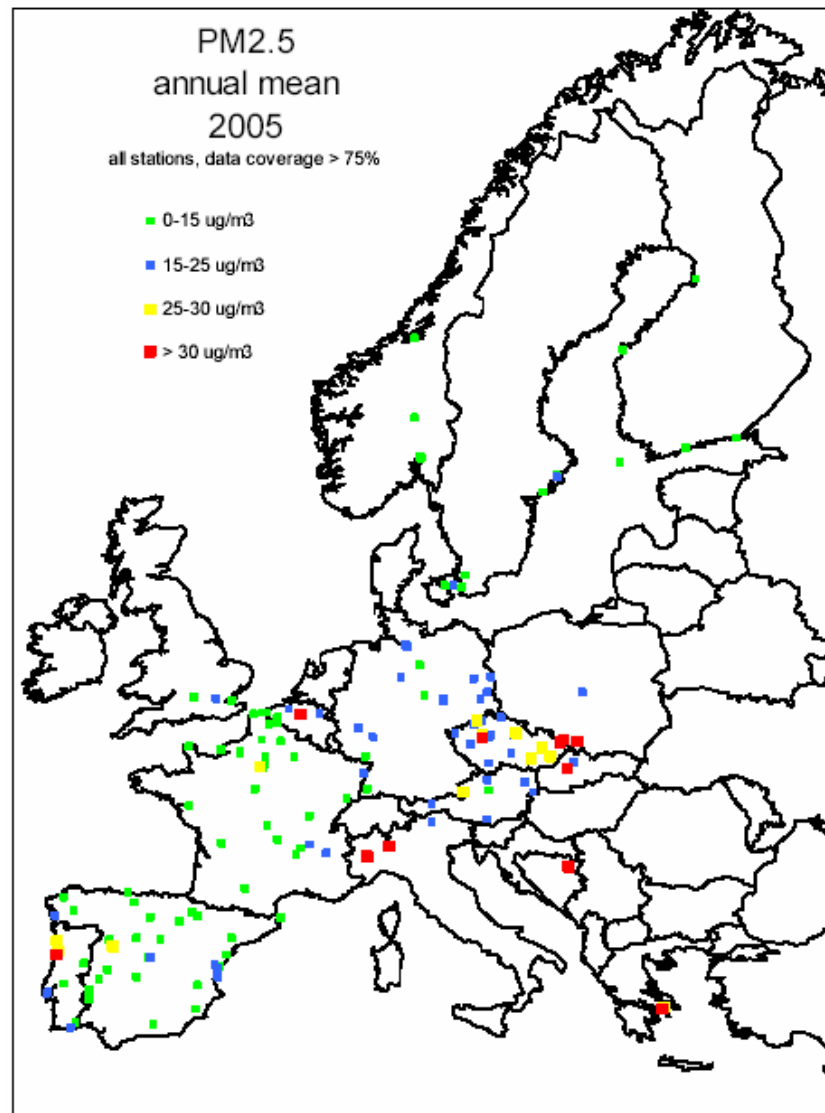
**Data from AIRBASE,  
all types of stations**





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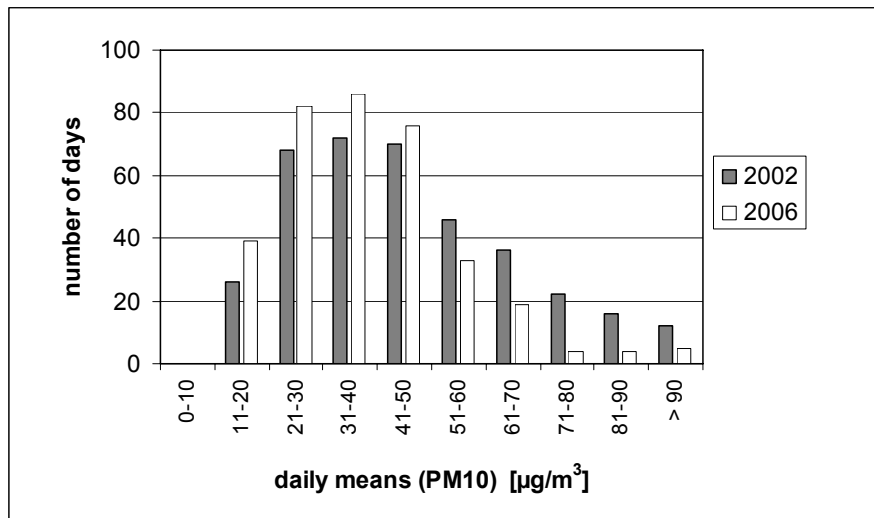


# **Plans and programmes for PM10 abatement reported by Member States until end of 2006 (1)**

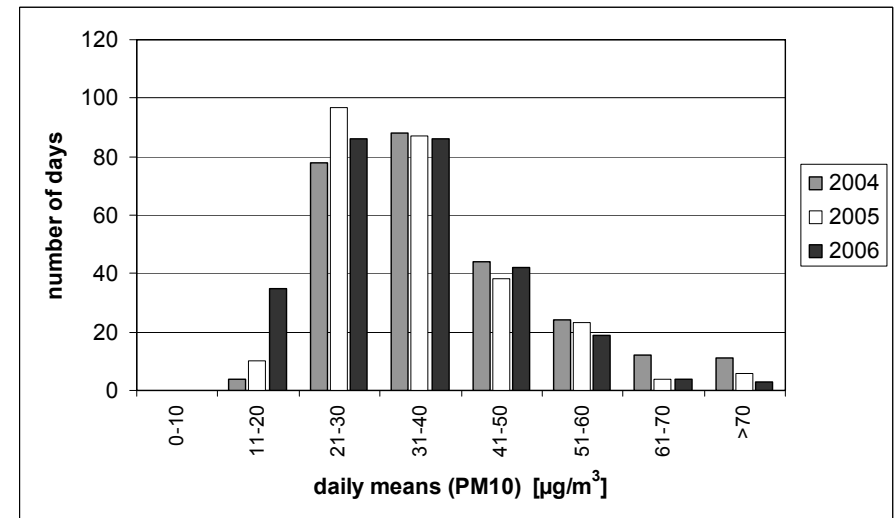
***(Report 0079, Umweltbundesamt, Austria)***

- About 140 plans and programmes (all pollutants) from 10 MS
- Sept. 07: > 200 plans and programmes
- 64 % of PM10 exceedances due to traffic
- 33 % PM10 exceedances due to industry

# Effects of local abatement measures (examples)



**a) industrial:**  
**steel mill Du-Bruckhausen:**  
**PM10 (annual mean) – 15 %**  
**PM10 (daily exc.) – 50 %**



**b) traffic:**  
**Düsseldorf-Corneliusstraße:**  
**PM10 (annual mean) – 13 %**  
**PM10 (daily exc.) – 43 %**

# Thematic Strategy on air pollution

- CAFE: Clean Air For Europe
- Published Sept. 21, 2005 as political paper (Communication to Council and EP)
- Objective: attain air quality which has no significant negative impacts on health (WHO) and the environment
- Integrated approach (PM, O<sub>3</sub>, eutrophication, acidification)
- IAM → optimized measures
- If not possible: define interim targets
- Period: 2005 – 2020



# CAFE, preparatory studies

- 2nd PM Position Paper (2004)
- Updated WHO assessment, PM (2003)
- Integrated assessment modelling, IIASA (2005)
- Cost-benefit analysis, AEA Techn. (2005)
- 13 main meetings with stake holders
- Available under:  
[www.europa.eu/dg/env/cafe/index](http://www.europa.eu/dg/env/cafe/index)



# **WHO Recommendations (2003) (1)** *(regarding PM metric)*

- Fine particles (PM<sub>2.5</sub>) more hazardous than larger ones (mortality, cardiovascular, respiratory endpoints)
- Coarse PM fraction not innocuous
- PM<sub>2.5</sub> strongly associated with mortality and cardiopulmonary disease (*correlation cannot readily be explained by UFP*)



# WHO Recommendations (2003) (2)

*(regarding PM metric)*

- PM species contributing to toxicity:
  - metal content, PAH, other organics, endotoxins, PM<sub>2.5</sub>, UFP (< 100 nm)
- More research needed to establish links between UFP and health effects



- AQG for PM<sub>2.5</sub>
- Separate guideline for coarse PM may be warranted
- Black smoke (indicator for traffic) should be re-evaluated

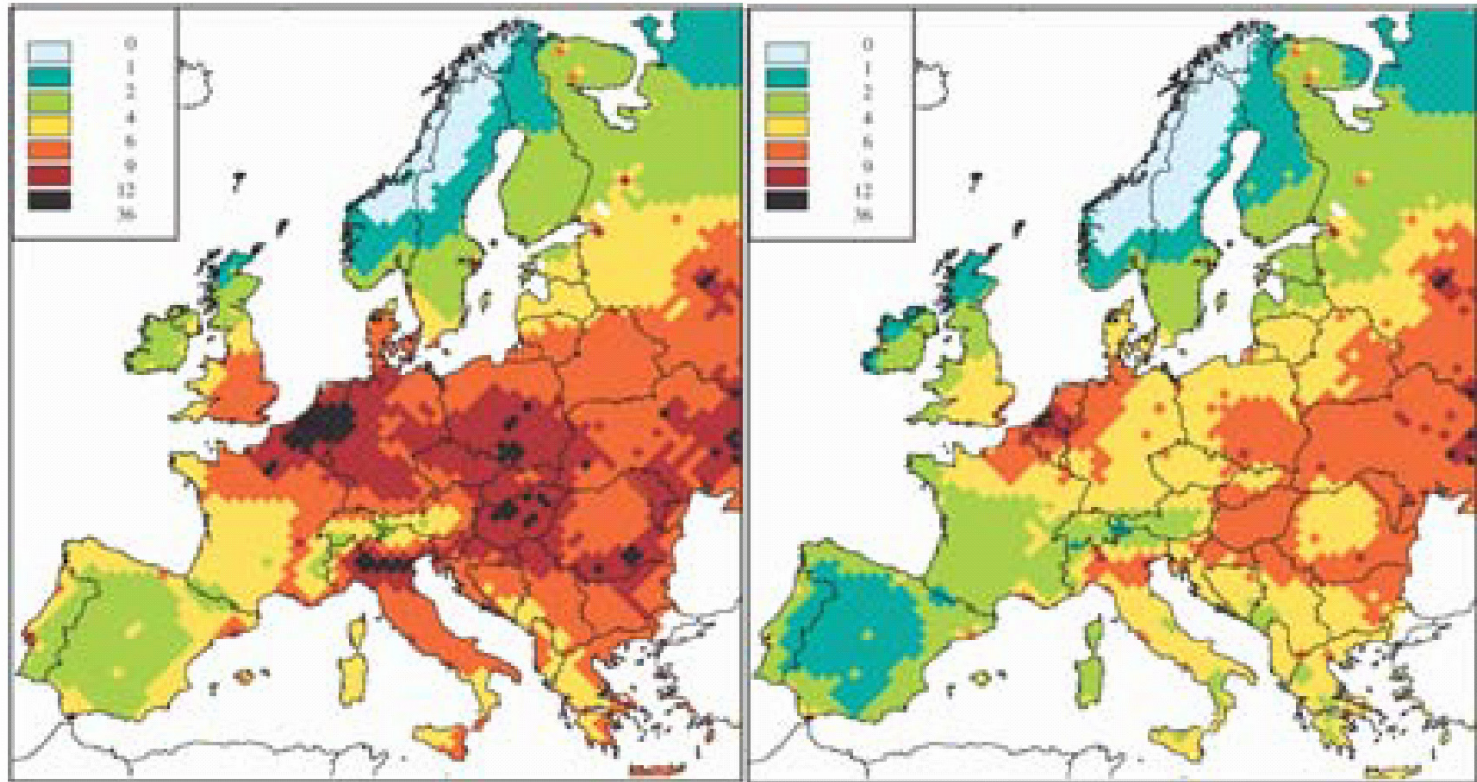
# Recommendations of the 2nd PM Position Paper (2004)

- In the light of WHO findings PM<sub>2.5</sub> principal metric
- PM<sub>10</sub> indicative LV (stage 2) → target values
- Too early to regulate PM<sub>1.0</sub> and UFP
- More research needed to establish concentration levels and links to adverse health effects for PM<sub>1.0</sub> and UFP (i.a. by around 20 EU „supersites“)
- Supplement LV by alternative approaches such as gap closure
- PM<sub>2.5</sub> annual mean: 12-20 µg/m<sup>3</sup>; daily mean (90 %): around 35 µg/m<sup>3</sup>;  
Starting points for Integrated Assessment Modelling

# Cost-benefit analysis (AEA Technol., 2005) *(examples)*

endpoint	pollutant	2000	2020 (baseline)
chronic mortality (premature deaths)	PM	347.900	271.600
acute mortality (premature deaths)	O <sub>3</sub>	21.400	20.800

- ⇒ **PM most important pollutant for health effects**
- costs caused by health effects (2020, baseline): 189 – 609 x 10<sup>9</sup> €/a
- ⇒ **Costs (CAFE): 7,1 x 10<sup>9</sup> €/a; benefits (PM): 42 x 10<sup>9</sup> €/a**



**Estimated losses in life expectancy (in months)  
attributable to exposure to fine particulate**

**2000**

**2020**

**Source: IIASA, 2005**

# Measures proposed under CAFE (*selection*)

## Revision of air quality legislation

- (proposal: Sept. 21, 2005)
- Revision of NEC Dir. (i.a.: include PM) ⇒ 2008
- Combustion plants < 50 MW  
(include in IPPC Dir.)
- Emissions from new passenger cars (EURO 5  
(2009), 6 (2014))
- Emissions from heavy duty veh. (EURO VI)
- Guidance for low emission zones

# Revised AQ Dir., key elements (1)

*(Common Pos., 25/06/07)*

- Harmonization and merging of FWD, 1.-3. DD, EoI Dec.
- Areas where limit values apply:
  - Human health: everywhere (except working places)
  - assessment: exposure is taken into account (Annex III)
  - Vegetation: large areas
- Limit values for PM10 (stage 1) unchanged
  - Stage 2 deleted
- Limit and target values for other pollutants unchanged



# Revised AQ Dir., key elements (2)

*(Common Pos., 25/06/07)*

- Exceedances due to natural sources may be disregarded
  - guidance by COM
- Date for compliance postponed for certain notified zones, if plans and abatement measures are established:
  - until 2015 (NO<sub>2</sub>, benzene)
  - 3 years after entry into force (~ 2011)
  - max. MOT shall not be exceeded

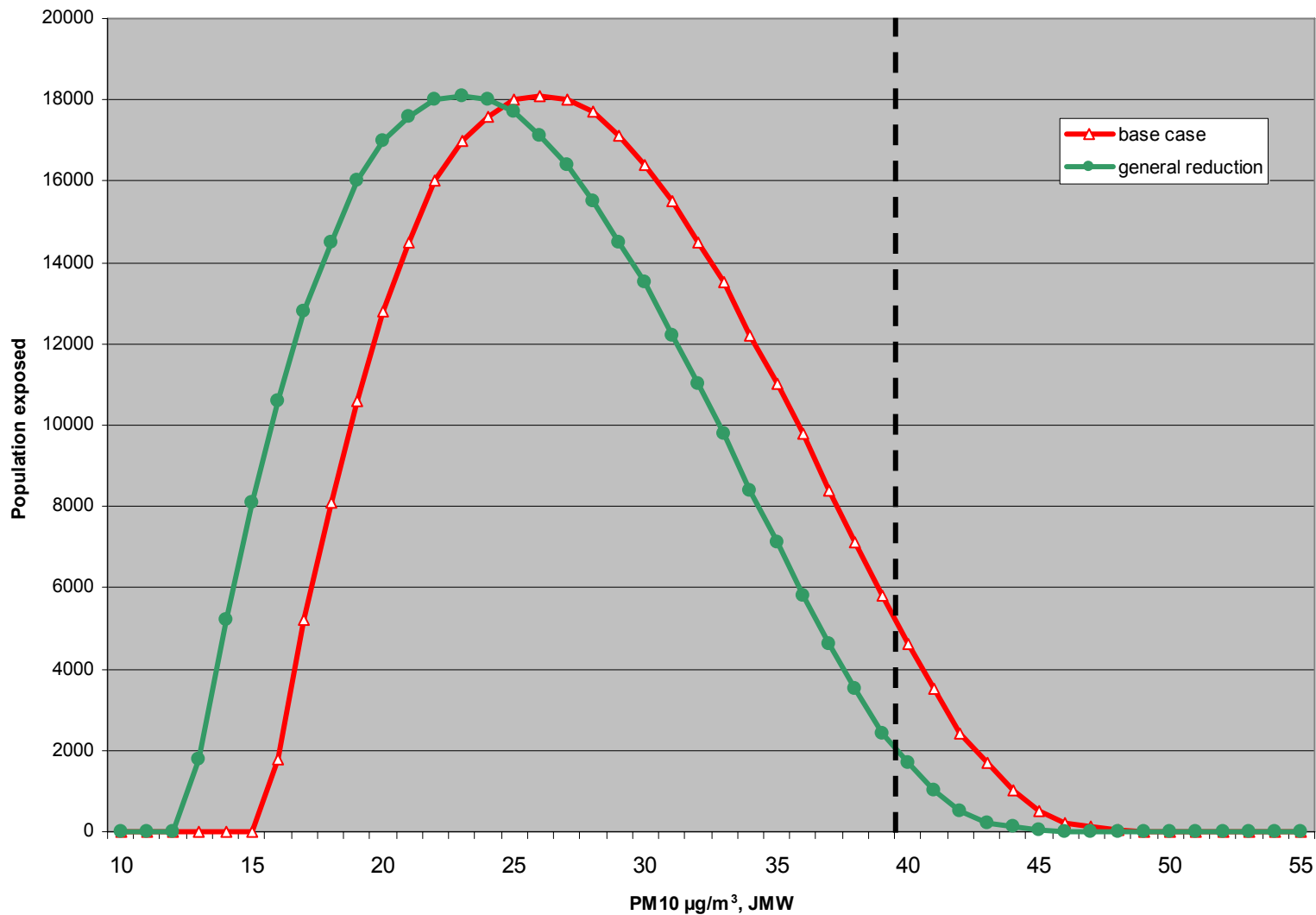


# Revised AQ Dir., key elements (3)

*(Common Pos., 25/06/07)*

- PM2.5 (annual mean): 25  $\mu\text{g}/\text{m}^3$ 
  - until 2015: target value
  - 2015: limit value
- National exposure reduction target, PM2.5
  - reduction of av. urban background levels by 20 % (2008 - 10 vs. 2017 - 2020)
  - not legally binding
- Review in 2013
  - making target mandatory
  - taking into account latest scientific information

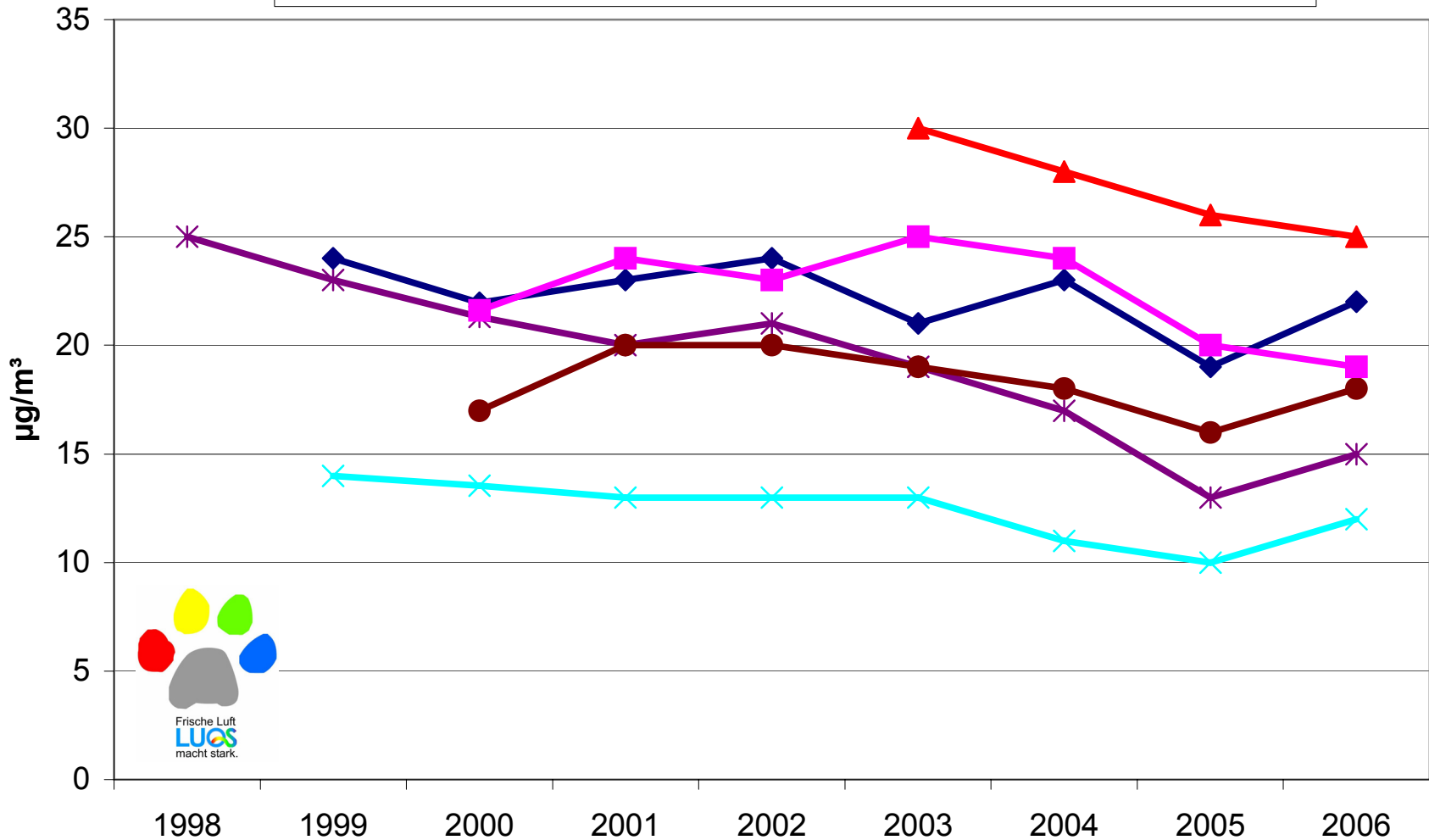




## Grenzwerte vs. Generelle Verminderung der Belastung bei Stoffen ohne Wirkungsschwelle

## Trend der PM2,5-Konzentrationen in NRW (Jahresmittelwerte)

EIFE \* LISE ● CHOR ◆ MEID ■ VESN ▲ DDCS



Frische Luft  
**LUOS**  
macht stark.

# Revised AQ Dir., key elements (4)

*(Common Pos., 25/06/07)*

- Air quality plans also after attainment date
  - short term actions only, if appropriate (except alert thresholds)
- Monitoring:
  - hot spots: street segments > 100 m; 250 x 250 m (industrial)
  - $N_O$  ( $\Sigma$ ) of PM10, PM2.5 stations reduced
  - modelling, indicative measurements may supplement assessment
  - PM2.5 speciation ( $NO_3^-$ , EC, etc.) at 3-4 rural stations

# Revised AQ Dir., state of proceedings

- COM Proposal 21/09/05
- Political agreement (Council) 23/10/06
- Common position 25/06/07
- EP, 1st reading 26/09/06
- EP, vote in Committee on the Environment 09/10/07
- EP, 2nd reading 12/07
- Enter into force mid 2008?



# Main remaining points of discussion

Item	Common pos.	Committee on Envir., Oct. 9, 07
measures beyond BAT for IPPC installations	yes	no
applicability of LV	everywhere (exposure taken into account for monitoring)	exposure taken into account
prolongation of attainment dates	PM10: 3 years after entry into force	PM10 and PM2.5: 3+2 years
PM2.5 exposure red. target	> 13 $\mu\text{g}/\text{m}^3$ : 20 %	15-20 $\mu\text{g}/\text{m}^3$ : 15 %; 20-25 $\mu\text{g}/\text{m}^3$ : 20 %
PM2.5 target and limit value	25 $\mu\text{g}/\text{m}^3$	20 $\mu\text{g}/\text{m}^3$
PM10 limit value	40 $\mu\text{g}/\text{m}^3$	33 $\mu\text{g}/\text{m}^3$

THE AGONY OF CHOICE: „Select Your, Favorite' Exposure !"



Mike

\* HEPA® - Filter: HEPA (High-Efficiency-Particulate-Air-) Filters (for Vacuum Cleaners)