

Paper/Poster-Abstract Form

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Title: The upcoming revision of the European air quality directives – state of play in respect to particles

Abstract: (min. 300 – max. 500 words)

The abstracts for papers and posters must contain unpublished information on your research subject: background, investigation methods, results and conclusions. Graphs and references are very welcome. Acronyms should be avoided. Abstracts with < 300 words can not be considered. General information on products which are already commercially available can not be accepted as presentations for the conference but are very welcome at the exhibition of particle filter systems and nanoparticle measurement instruments.

Abstract

In an orientation debate in the European Commission (EC) in January 2011, the commissioner on the environment, Mr. Janez Potocnik, proclaimed 2013 as the “year of air”. Important EC directives on air quality (2008/50/EC and 2004/107/EC) as well as the directive 2011/81/EC on national emission ceilings will be revised. The preparatory work for the revision and the state of play in respect to particles will be presented.

A stakeholder working group to present and discuss results of preparatory studies and a questionnaire for stakeholders and the public are important elements of participation. The questionnaire asked, inter alia, for important topics for the revision. Among priorities such as stability in regulation or better coherence of air quality objectives and EC wide abatement measures ranked the following topics: put more weight on harmful PM fractions (elemental and organic carbon); simplify the “zoo” of existing air quality objectives for particles, consider new components and metrics such as BC, UFP, deposition of heavy metals and stress the importance of exposure reduction versus the pure limit value approach. The commission will consider these and other top items as “checklist” for the revision.

The European Commission has launched several important studies to prepare the scientific basis for the revision such as the baseline scenario of the EC 27 emissions up to 2030, the presentation and assessment of our current scientific knowledge on the effects of air pollutants (among them different metrics of particles) by a WHO working group (REVIHAAP), and a questionnaire among Member States on the monitoring of PM_{2.5}, heavy metals and benzo[a]pyrene. In respect to particles much will depend on the expertise of REVIHAAP, which will deal explicitly with the effects of other particle metrics (UFP, black and elemental carbon) and other constituents of particulate matter on human health.

Whereas there seems to be broad consensus that soot is a more specific and sensitive marker for traffic related abatement measures than PM mass, the case for limit values for soot or UFP is less clear and would need strong support from the effects community to overcome obvious disadvantages from a regulatory point of view: the uncertainty of compliance checking (monitoring) will increase in comparison to PM mass and modelling will be difficult or impossible as emission inventories particular for industrial sources are patchy at best or non existing. In addition, coagulation of UFP had to be included

into the dispersion models. On the other hand, comprehensive monitoring which can be used to establish a data base for effect related research will only happen if there is some monitoring obligation.

To overcome this “hen and egg” problems a working group of the German states in preparation of a German position for the upcoming negotiations has proposed a monitoring obligation for UFP and soot at some stations of different air quality per member state, following the concept of the supersites in the USA.

Another problem to be addressed by the revision is the exposure indicator versus the limit value approach. Following this concept for compounds without apparent health effects threshold such as PM, more is gained for public health by reducing the average exposure in residential areas instead of “limit value chasing” at hot spot locations. In the revision process, it has to be decided to make the exposure reduction obligation for PM_{2.5} legally binding or not. There is a close connection of this question to the establishment of a national emission ceiling for primary PM_{2.5} emissions in a revised NEC directive and in the UNECE protocol.

An open question to be addressed is also the particle fraction to be sampled (PM₁₀ or PM_{2.5}) for the analysis for constituents such as heavy metals and benzo[a]pyrene.

Short CV:

PhD in Chemistry 1974, Head of Division “Air quality, noise, vibrations, radioactivity” at the state agency for nature, environment and consumer protection since 1994, lectures at Bochum University, representative of the German states in several EC working groups on air quality.

**Return by e-mail latest 14th of April 2012 to
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The upcoming revision of the EC air quality directives

- 2013: „Year of the air“
- Revision of CAFE
(Clean Air For Europe)
- State of play



Focus Event, Zurich, ETH, June 26th, 2012



CAFE

Source
related
measures
(e.g. EURO6,
IED Dir.)

NEC
2001/81/EC
(UNECE)
national
reduction
plans

Air Qual. Dir.
2008/50/EC
local/regional
measures, air
qual.
objectives



EC Consultation process

- Stakeholder WG
(http://circa.europa.eu/Public/irc/env/caf_e_baseline/library?|=/&vm=detailed&sb=Title)
- Studies (e.g. baseline em. scenario (*IASA*), REVIHAAP (*WHO*), PM2.5, heavy metals, PAK (*UBA Vienna, TNO*), AQUILA (*monitoring*), FAIRMODE (*modelling*))
- Questionnaires (*stakeholder, experts, public*)
- Workshops (PM: June 2012)

Timetable of revision

2012:

Preparation and analysis

- 4 stakeholder meetings
- Air qual. expert group (MS)
- May 4th, 2012: Rev. Gothenburg Prot. (UNECE)
- Studies

2013:

Proposals

- Mid 2013: Rev. CAFE
- Further source related measures (e.g. small combustion units)
- Rev. NEC (target: 2030) *i.a. reduction PM2.5 emissions*
- Rev. air qual. dir. perhaps later



Revision Gothenburg Protocol (May 4th, 2012, Geneva)

- National emission reduction commitments for PM_{2.5} (2005 → 2020)
EU: 22 %; D: 26 %; CH: 26 %, NL: 37 %
(range: from 10 % (I) to 46 % (Cyprus))
- Soot (BC): „soft“ regulations
 - Emission standards for PM, with a particular view on BC
 - More R&D for BC

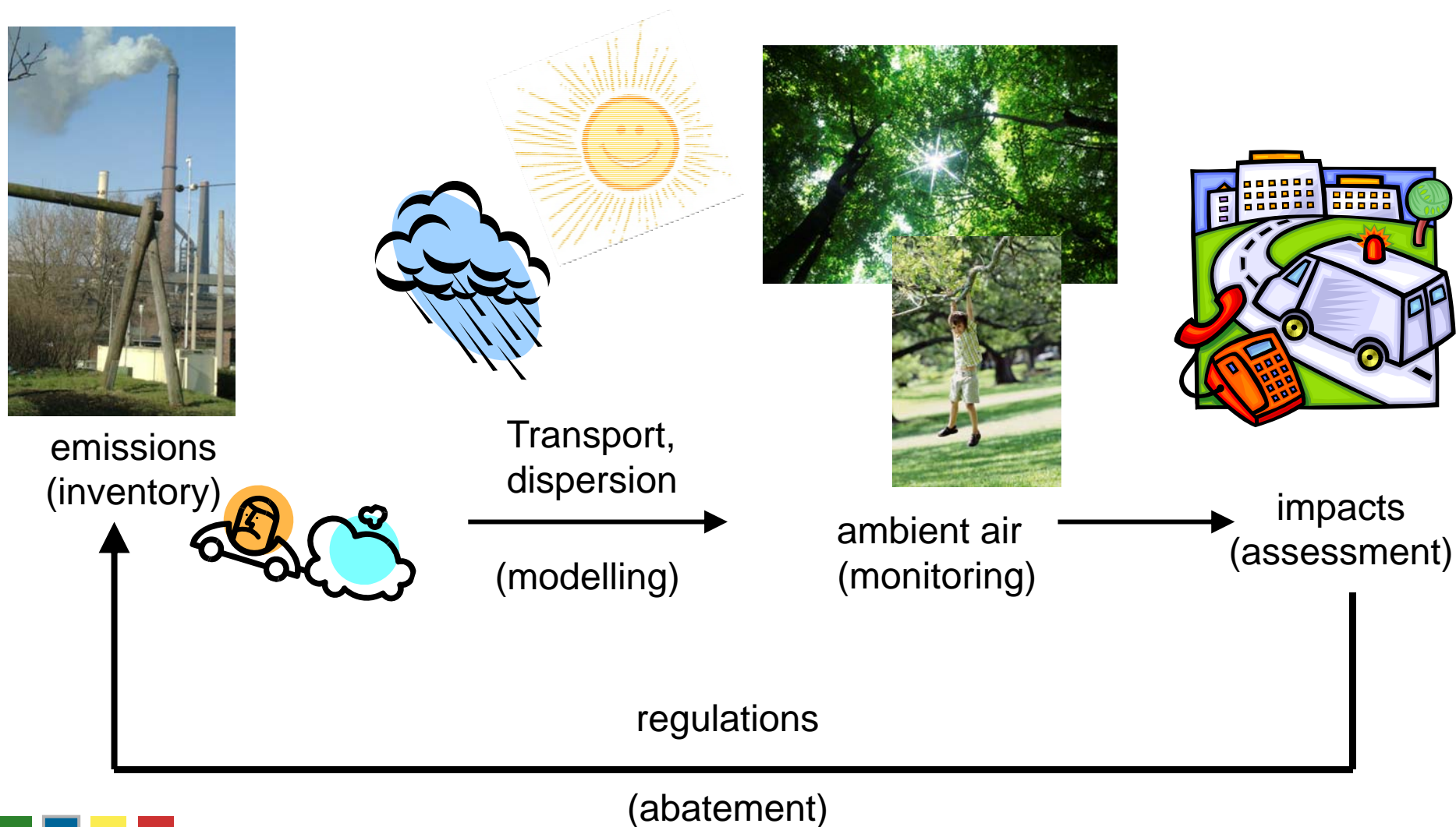


Stakeholder questionnaires (40)

- Better coherence of source related measures and air qual. objectives (23)
- Stability in regulation (18)
- Synergies and trade-offs with climate change (17)
- More ambition (14), flexibility (11), level playing field
- More stress on noxious PM components (EC, OC) (13)
- Simplification of PM regulation
- New components: BC/OC, UFP, dep. heavy metals (8)
- More stress on exposure reduction vs. hot spots (7)
- More modelling, better QA (10)

COM: checklist for rev.

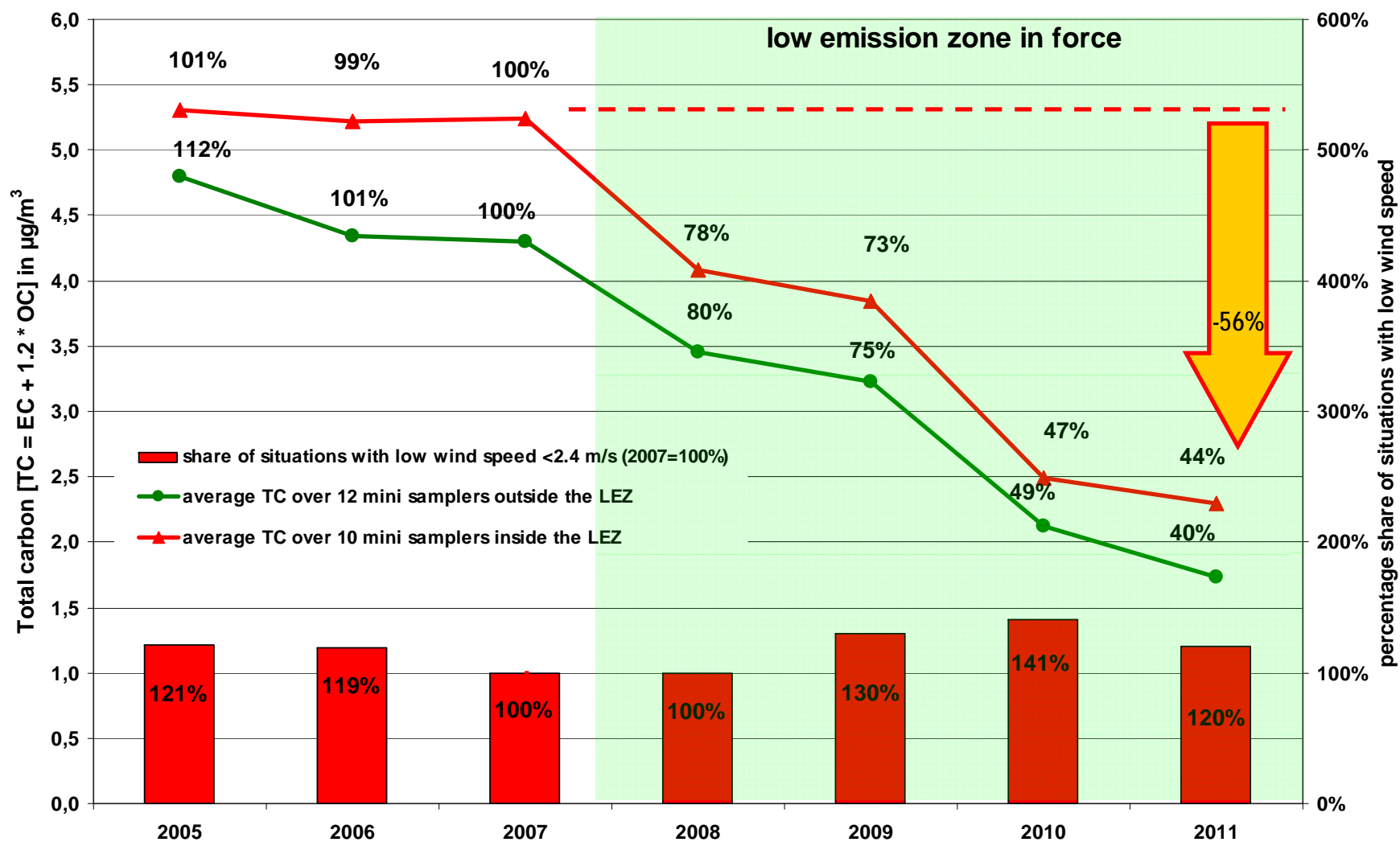
Regulatory process for ambient air



Which metric for PM regulation?

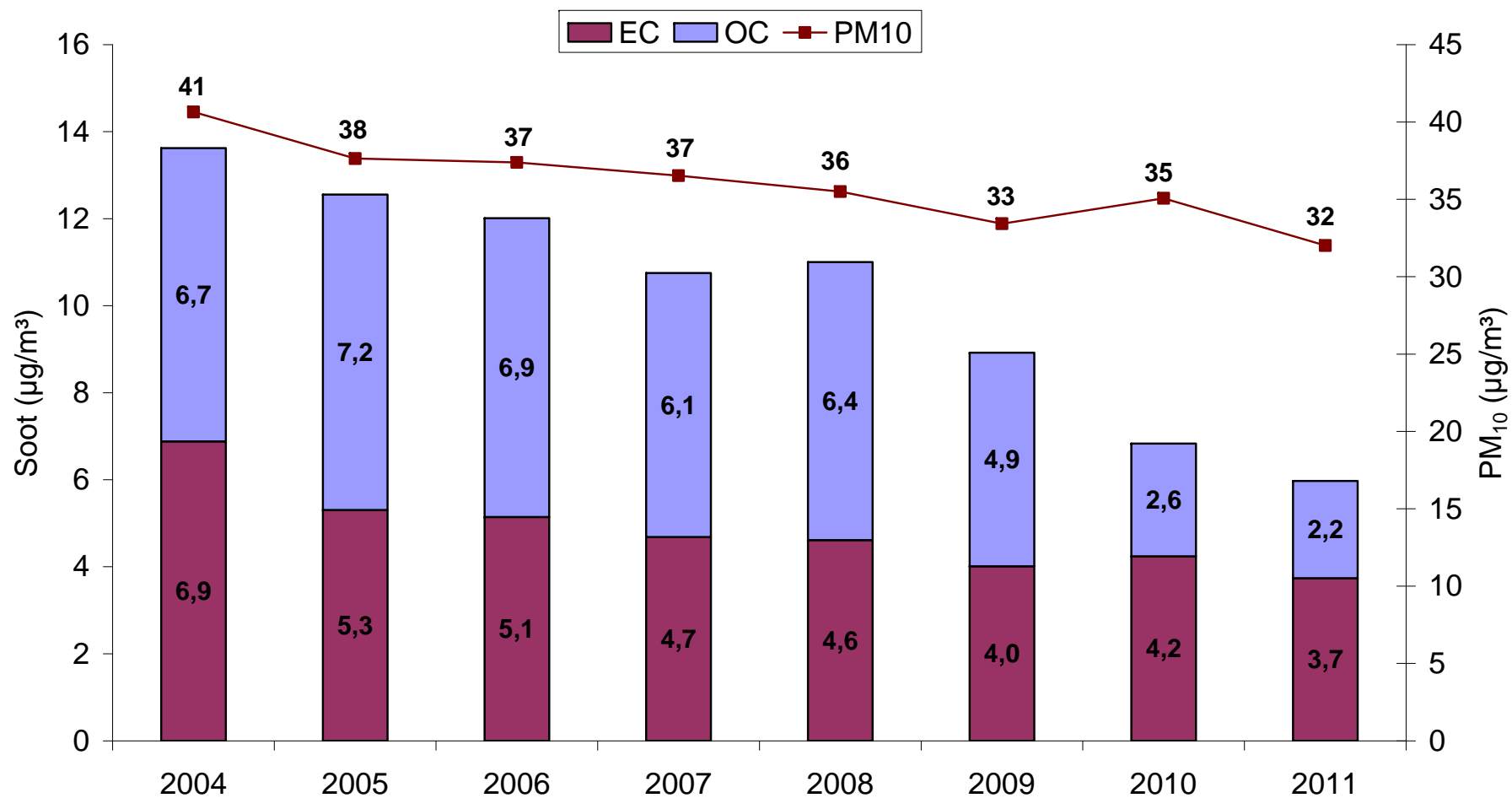
Instruments	PM (2.5, 10)	BC (EC)	UFP
Emission inventory	☺	☺	☹
Modelling	☺	☺	☹ (coagulation)
Uncertainty of assessment	☺	☺	☹
Effects	REVIHAAP (WHO)		
Sensitive benchmark for abatement (traffic)	☹	☺	☺
Additional costs for networks	-	moderate	high

Traffic related* total carbon particle concentration in Berlin (Lutz, 2012)



*traffic increment based on the difference between kerbside stations and urban background sites

Trend of PM₁₀, EC and OC (annual means) at Düsseldorf, Corneliusstraße



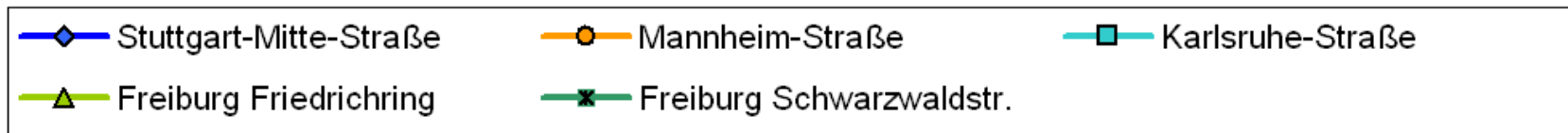
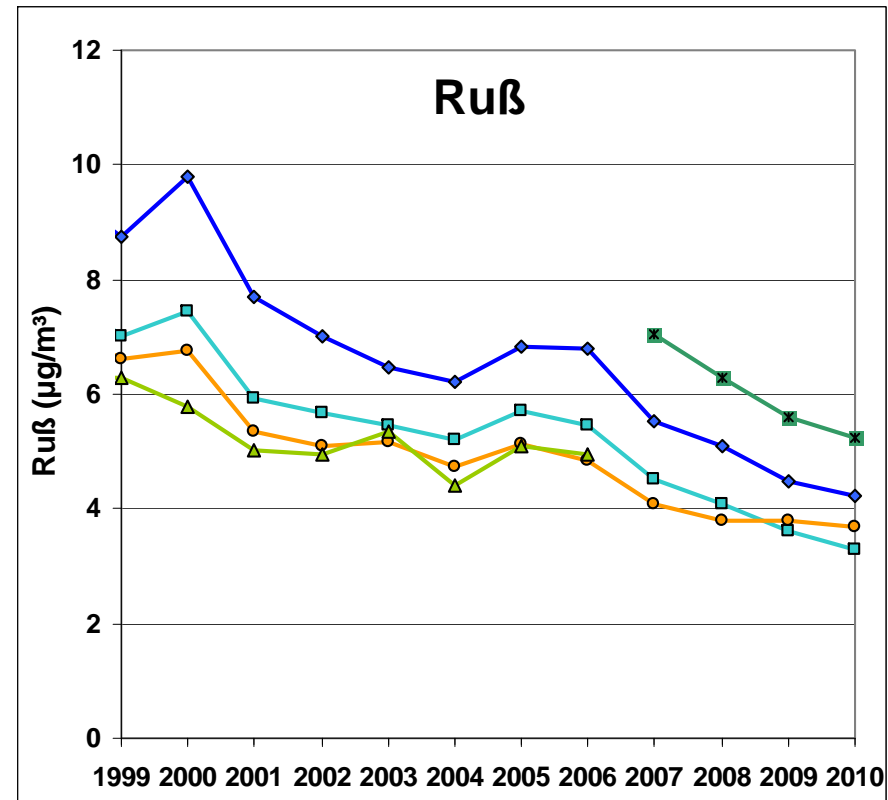
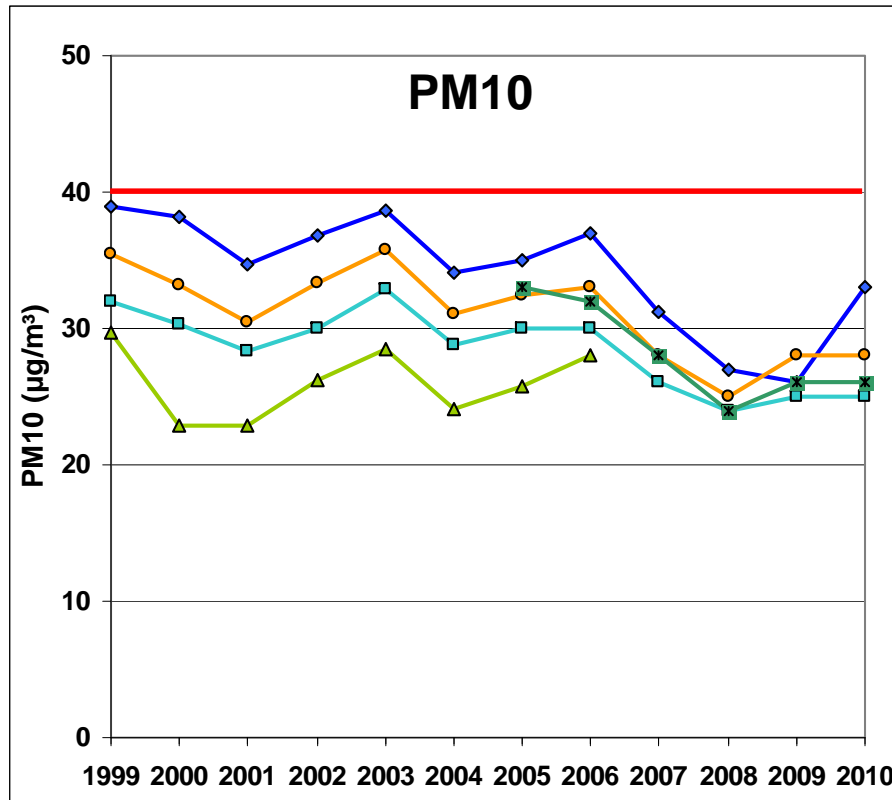
4/2005 ban
for HDV > 2,8 t

2/2009
LEZ

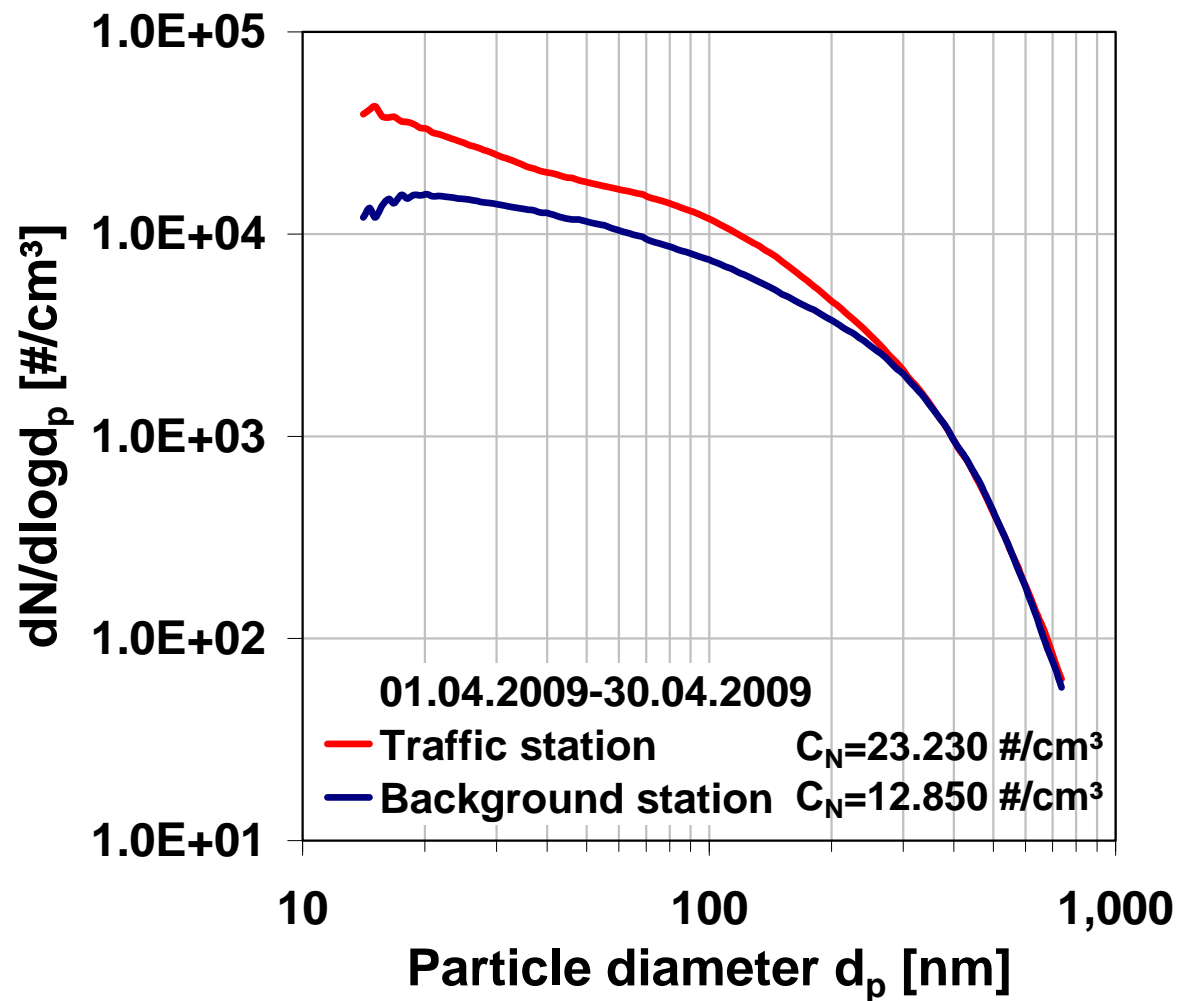
2009/2010
new method

PM10- and EC-Concentrations at traffic exposed sites in Baden-Württemberg (*Scholz, 2012*)

- annual means -



Particle number concentrations at a traffic exposed and an urban background site (Essen, Gladbecker Str. und Mülheim-Styrum) (*IUTA, 2009*)

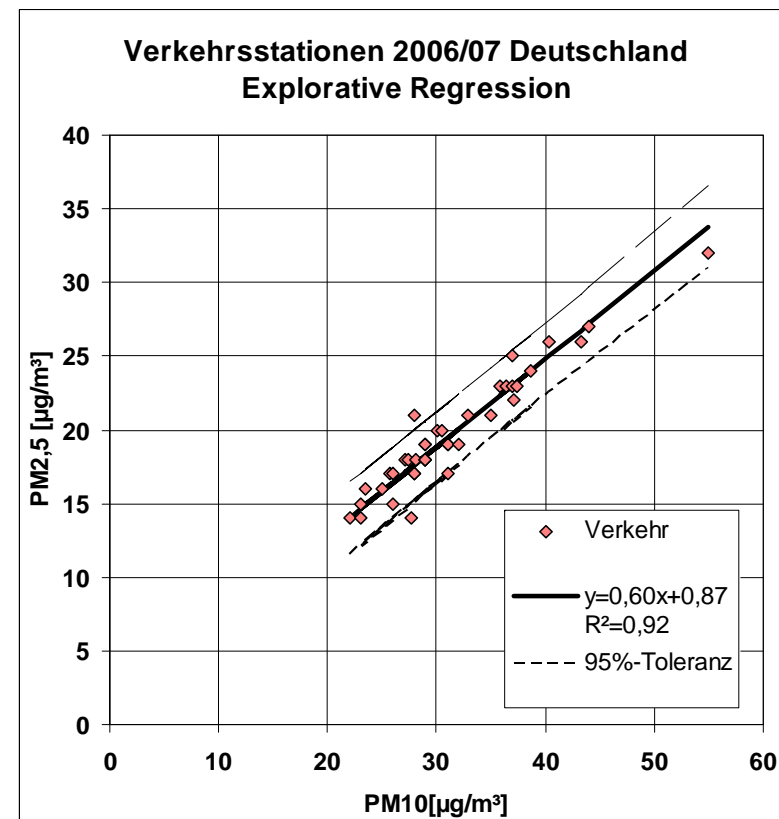
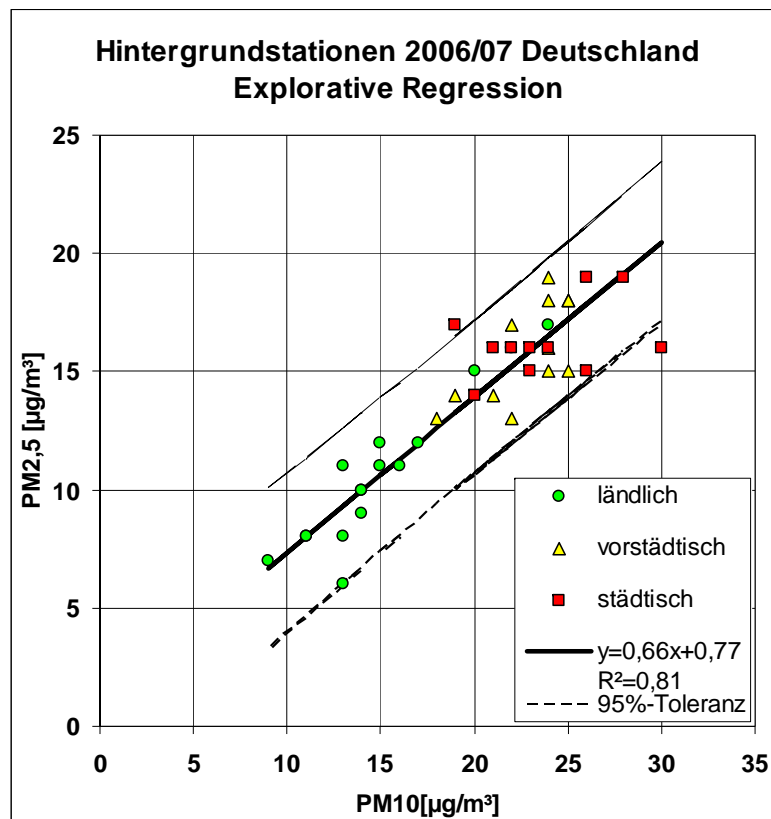


Recommendations of an expert group from German states on PM regulation

- Keep PM_{2.5} as most important metric for regulation
- Simplify „ZOO“ of PM air quality objectives (currently 7)
- Ambition level should be kept
- Monitoring obligation for UFP and EC at several sites per MS (*overcome „hen-egg“ problem for impact related studies, EC monitoring at traffic exposed sites as benchmark for abatement*)



Correlation of PM10 and PM2.5 (annual means) at German monitoring stations



The future

