PM10 in Austria – levels and sources

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Dr. J. Schneider

Head of Dep. of Air Quality Control

umweltbundesamt

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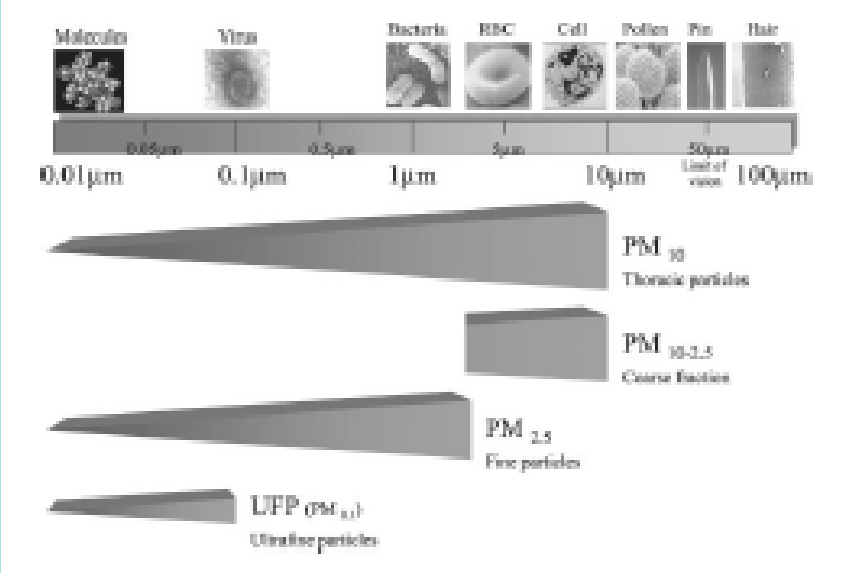
Introduction

What is PM10?



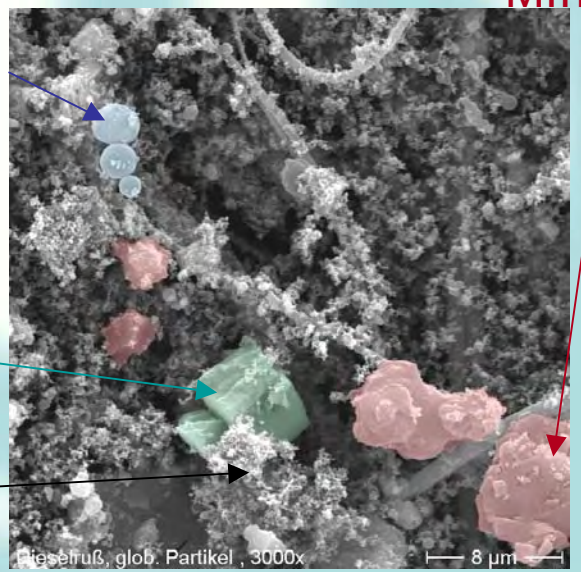
Elmi-picture PM10

Particles from combution

Salt

Soot

Mineral



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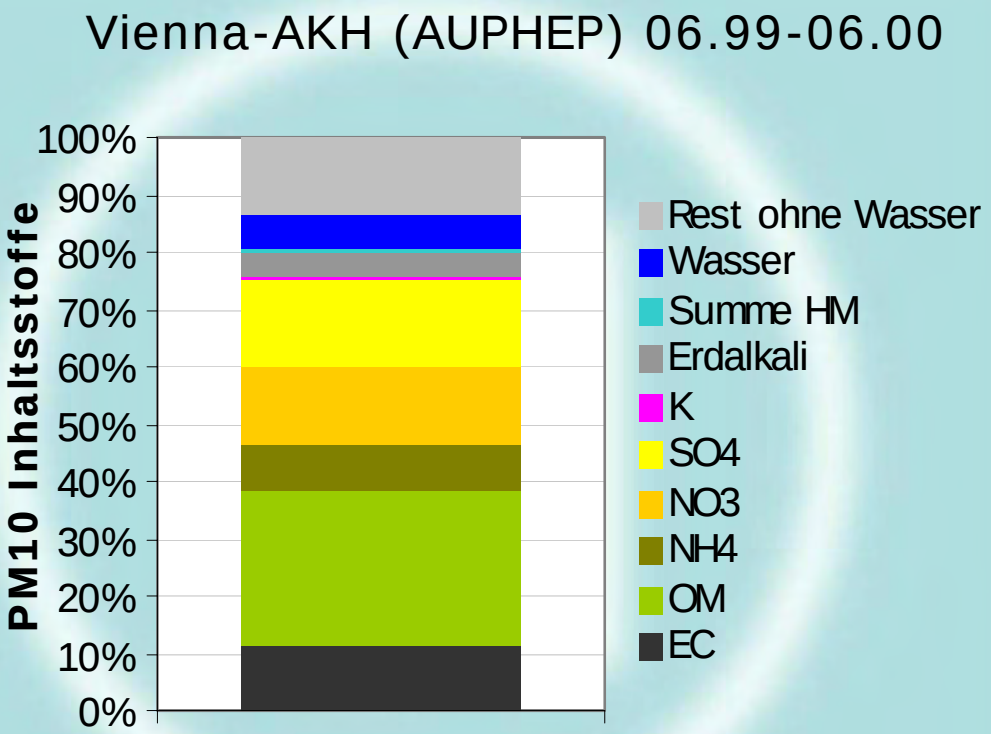
Introduction

PM10 is a complex mixture

- Chemical composition:
  - Organic carbon
  - Elemental carbon
  - Mineral Components
  - Salt (sea salt, ..)
  - Sekundary inorganic aerosols
  - Heavy metals (Fe,..)



Legal situation

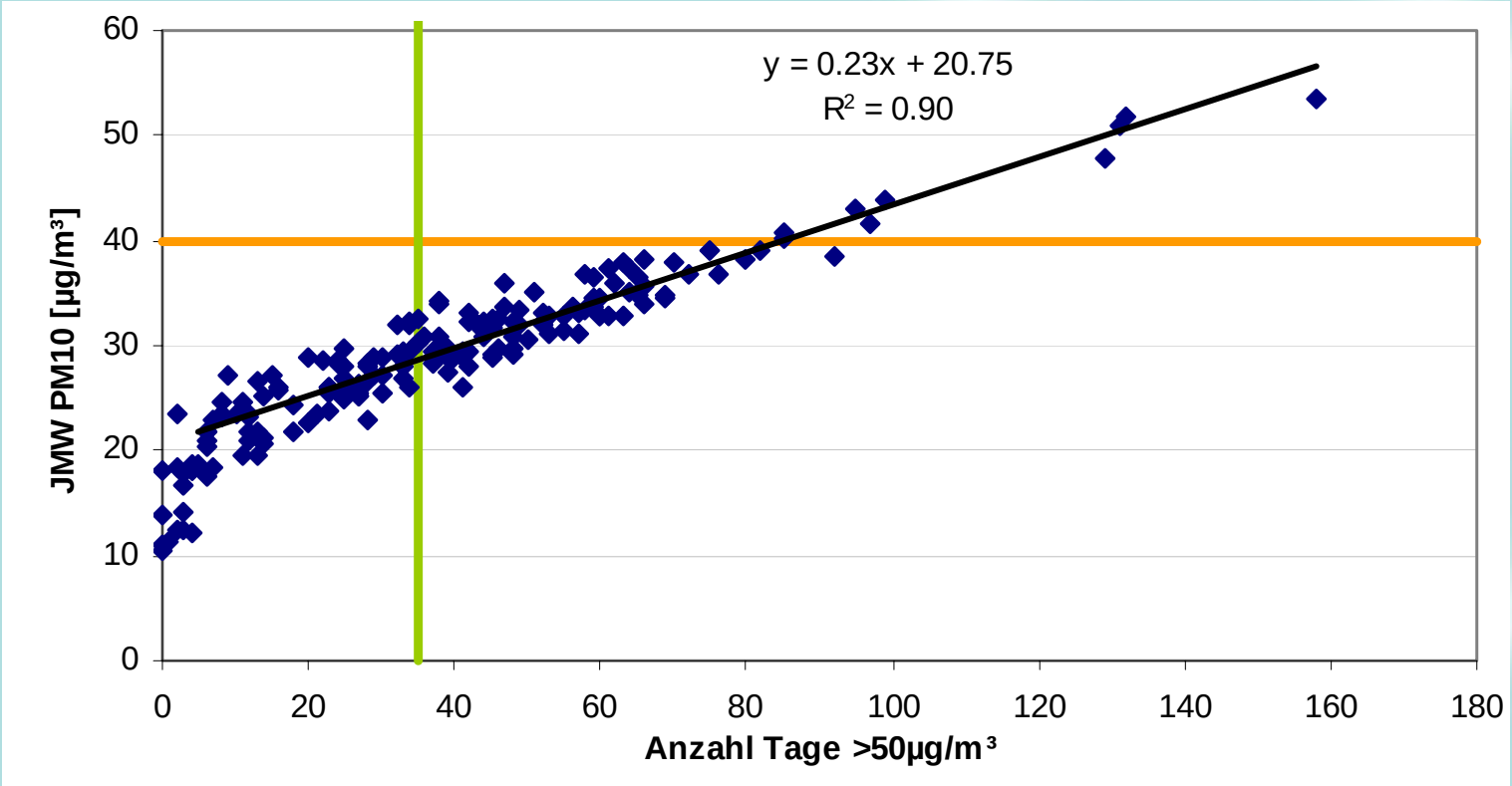
European Union

- Air quality framework directive 96/62/EC: general principles on air quality assessment and management
- 1. Daugther Directive 1999/30/EC contains LV for PM10 (and SO_2, NO_2, lead), provisions on monitoring and assessment
  - 40 µg/m³ as annual mean
  - 50 µg/m³ as daily mean, 35 exceedances per year are allowed

- Transposition date: Mid 2001
- Mid 2001 – end 2004: Decreasing MoT
- Attainment date: 2005

Legal situation

Correlation of the two LVs



Legal situation

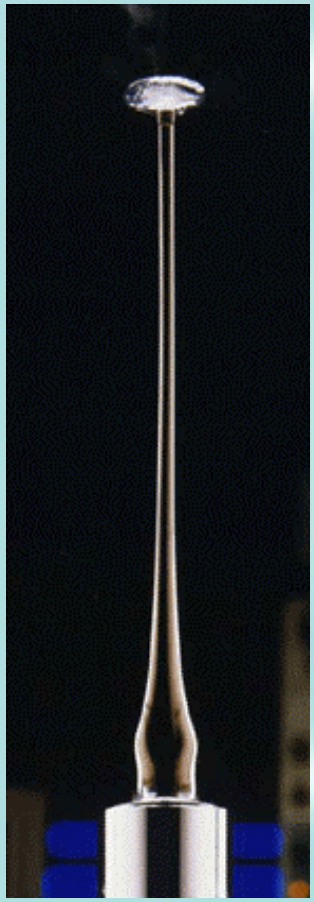
Austria

- Revision of Austrian Air protection Act (Immissionsschutzgesetz Luft) in 2001 to include PM10
  - 40 µg/m³ as annual mean
  - 50 µg/m³ as daily mean, 35 exceedances per year are allowed until 2004
  - 50 µg/m³ as daily mean, 30 exceedances per year are allowed until 2009
  - 50 µg/m³ as daily mean, 25 exceedances per year are allowed from 2010
- Federal provinces are responsible for implementation
- After exceedance -> detailed AQ assessment (‚Statuserhebung') -> AQ management plan (‚Maßnahmenkatalog-VO')

PM monitoring

Beta gauge

TEOM



gravimetric method

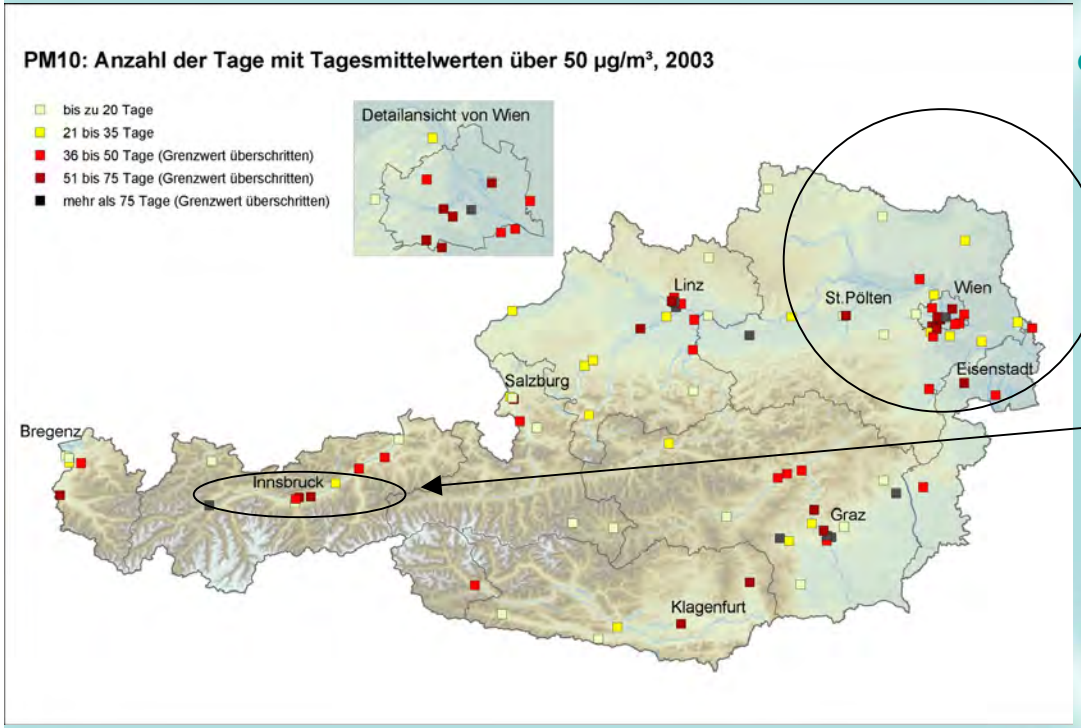
PM monitoring

No of PM10 sites in Austria

	gravimetric	Automated method	Gravimetric & automated method	Sum
2000	2		3	5
2001	4	33	6	43
2002	6	53	9	68
2003	8	59	16	83

PM10 levels

Exceedances of IG-L limit values in 2003



- Exceedances in all 9 provinces
  - Highest levels:
    - North eastern part (transboundary)
    - Large cities
    - Cities in valleys and basins with unfavorable dispersion conditions, in particular during winter time

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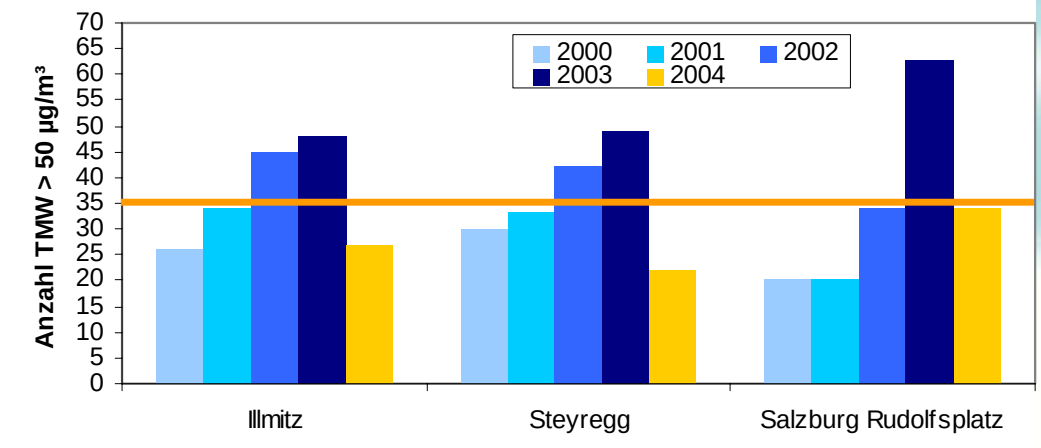
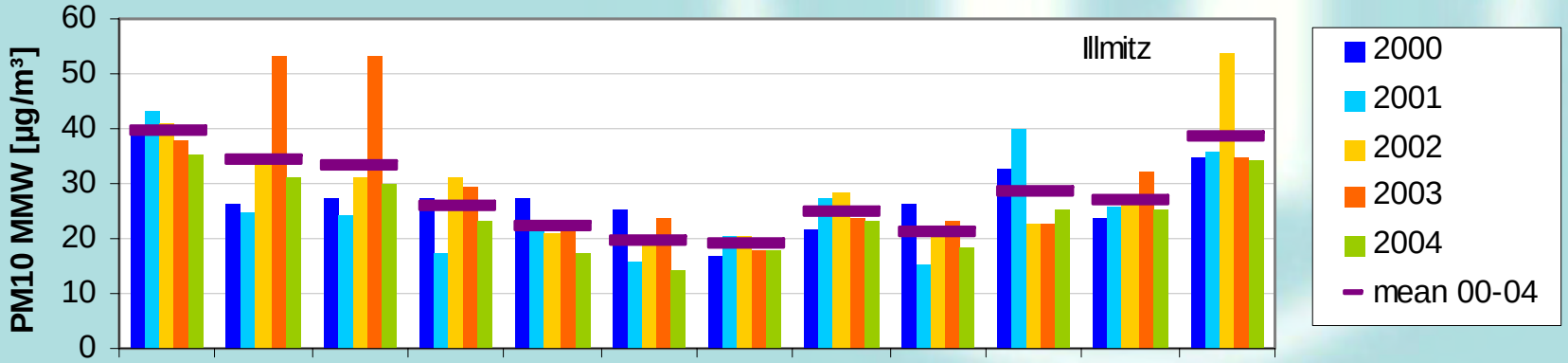
PM10 trends?





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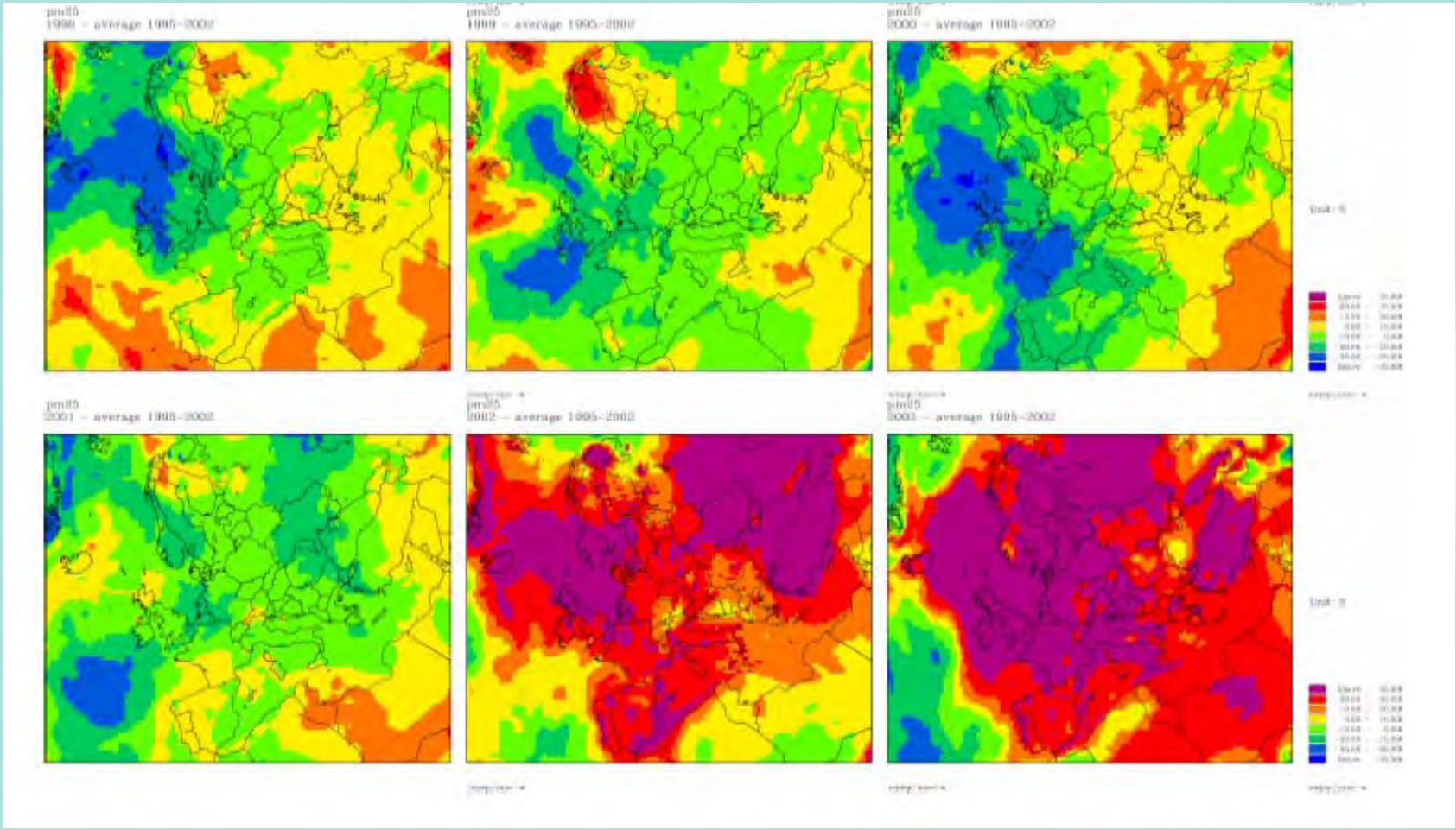
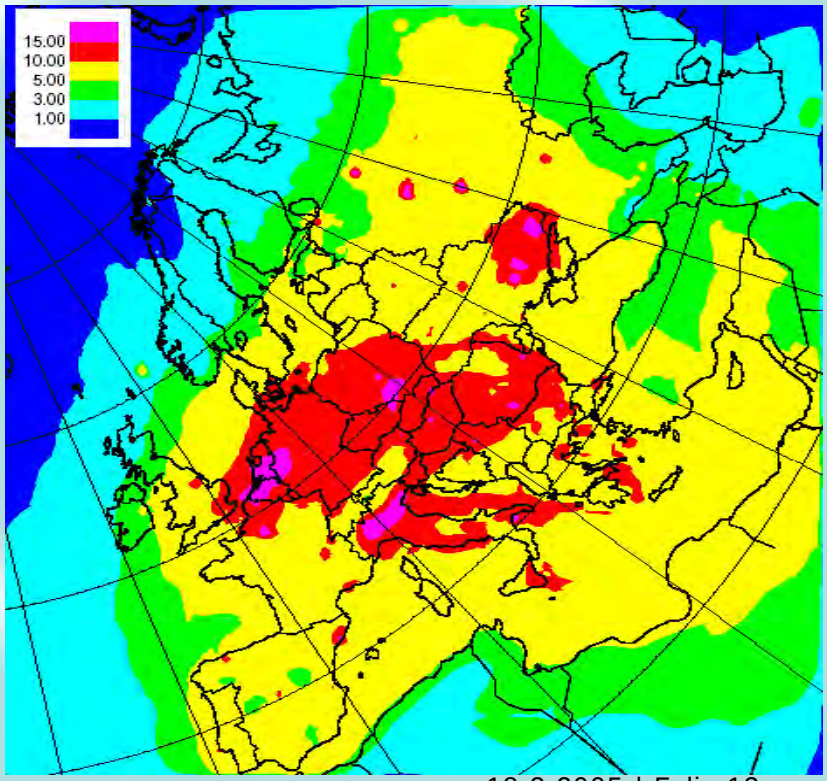
Interannual variability

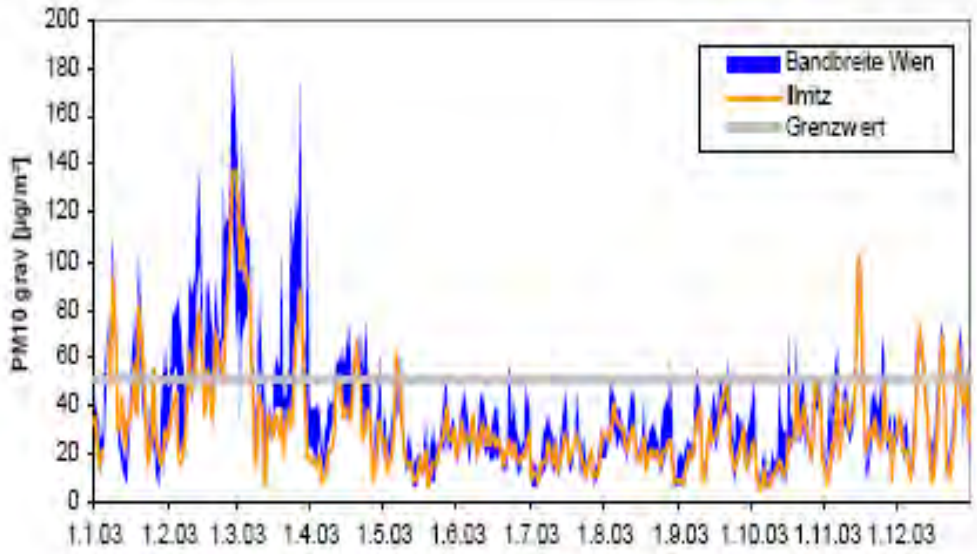


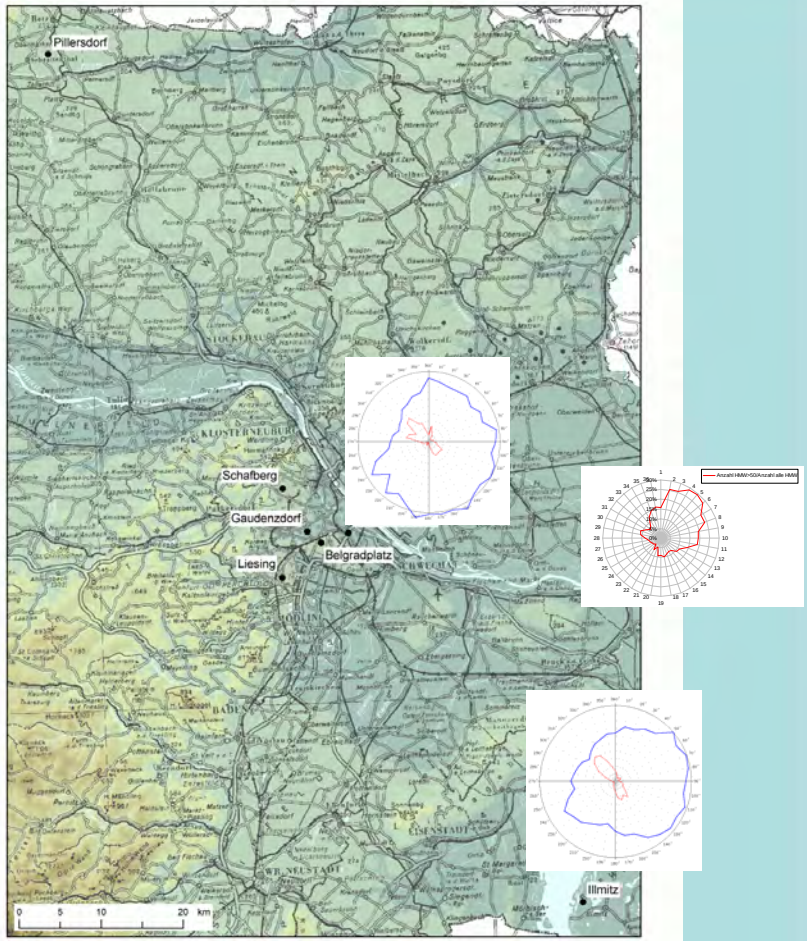
Sources

Exceedance in 2003 even at rural background sites



Sources





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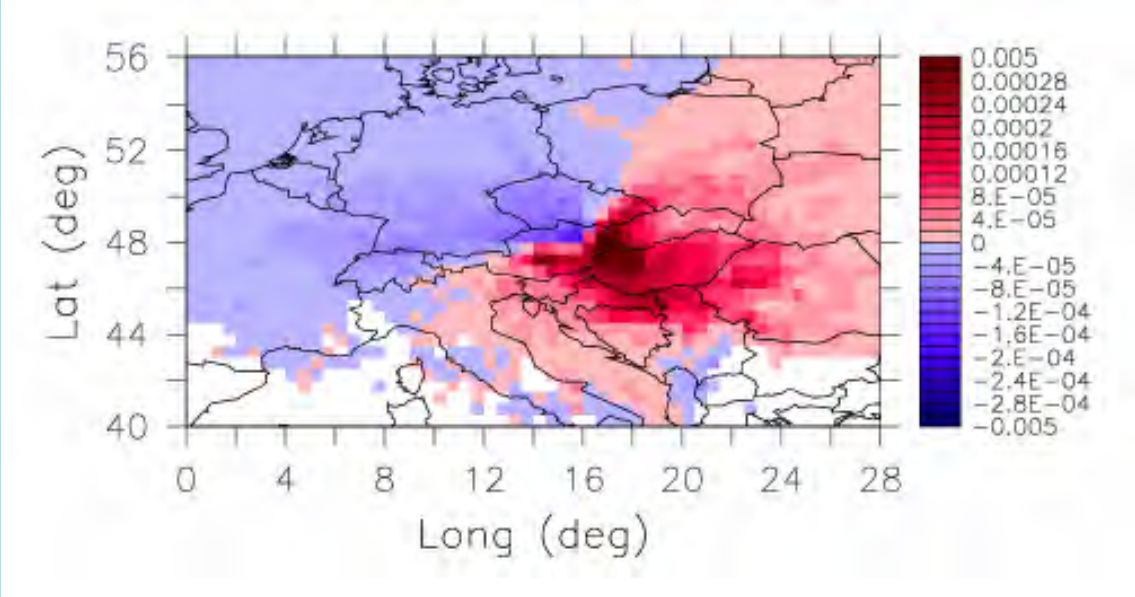
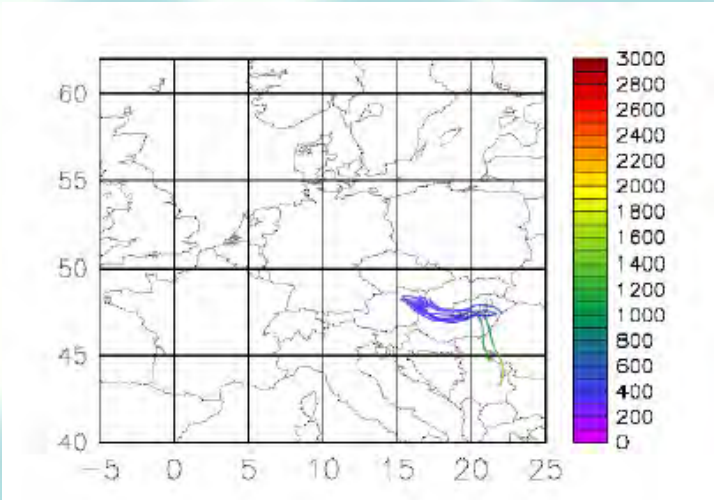
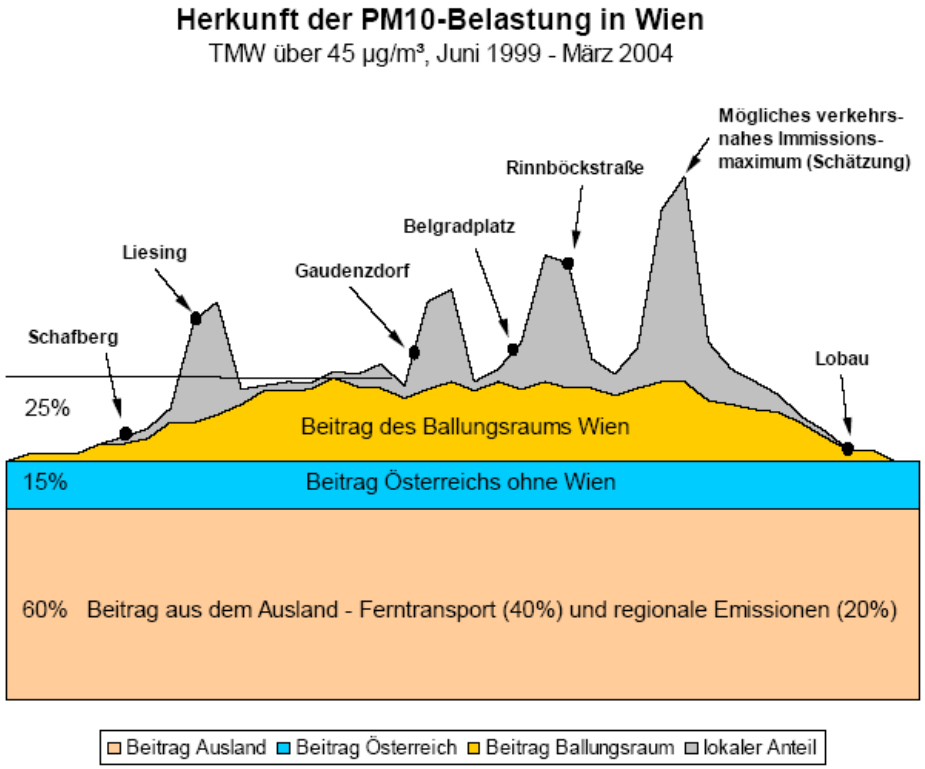
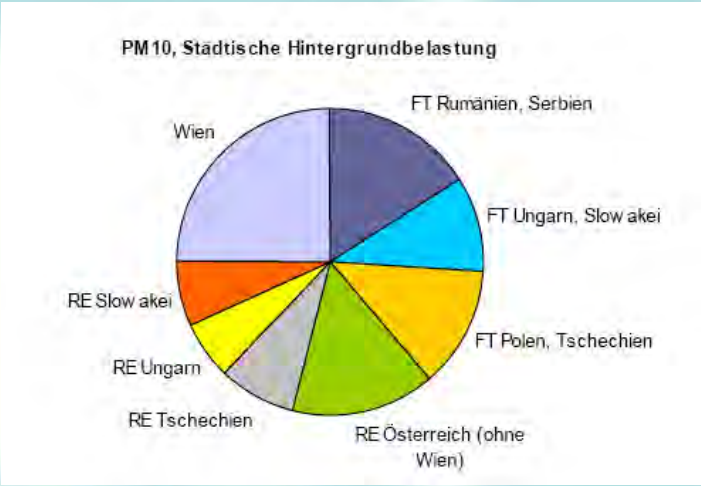
Back trajectories



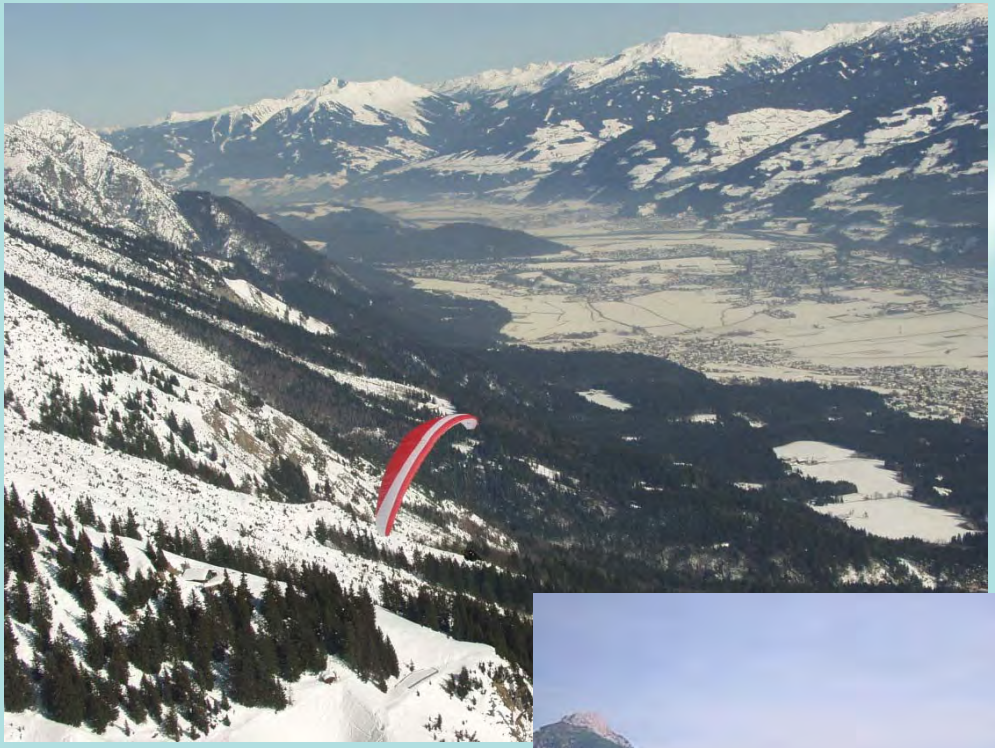


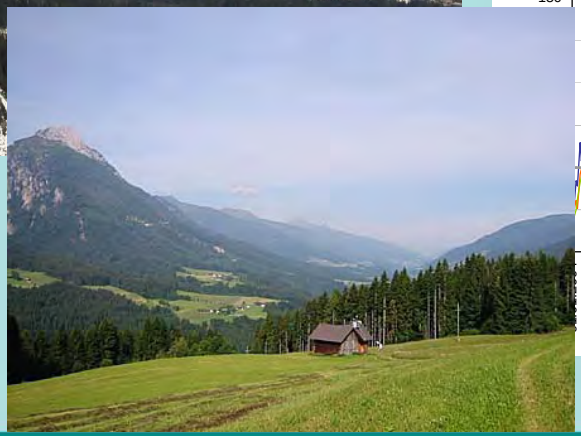
Source regions

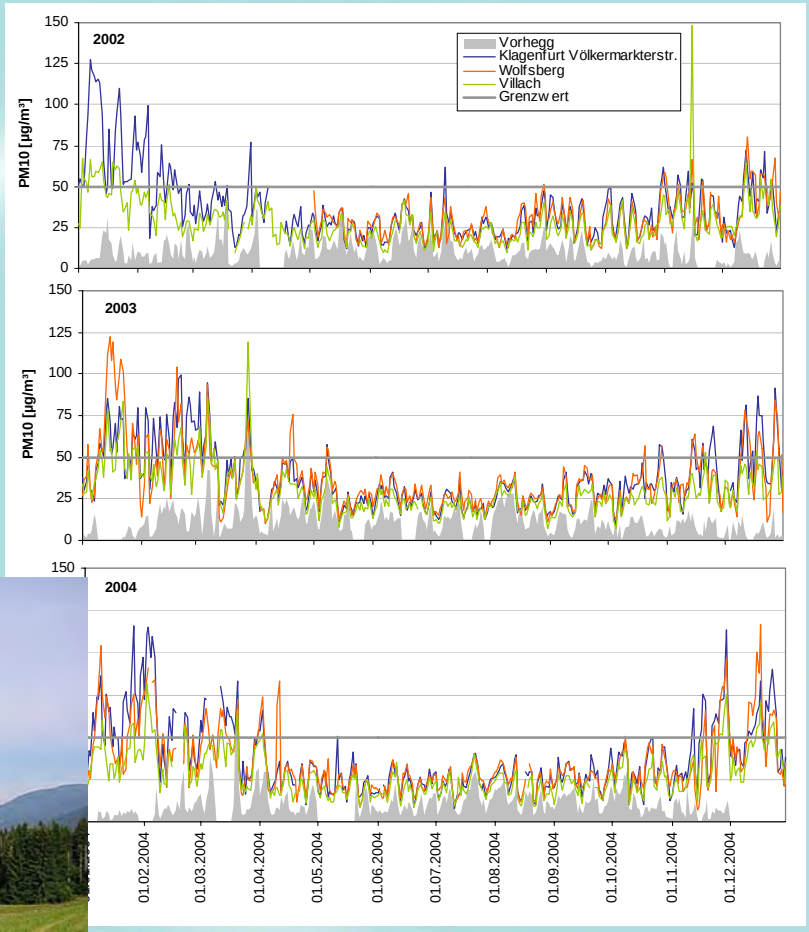




PM10 in Alpine areas







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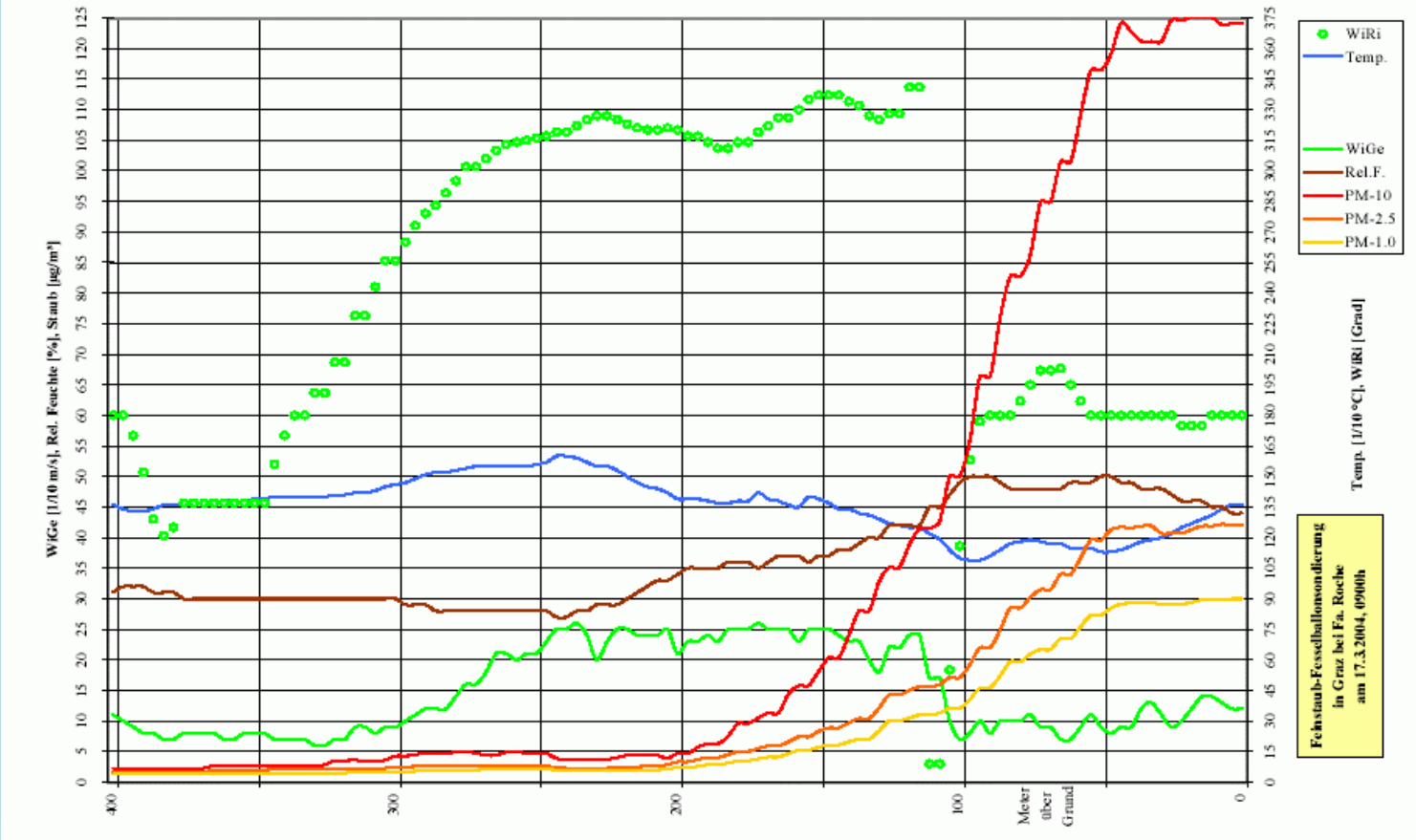
PM10 im alpinen Raum

PM vertical gradients in Graz



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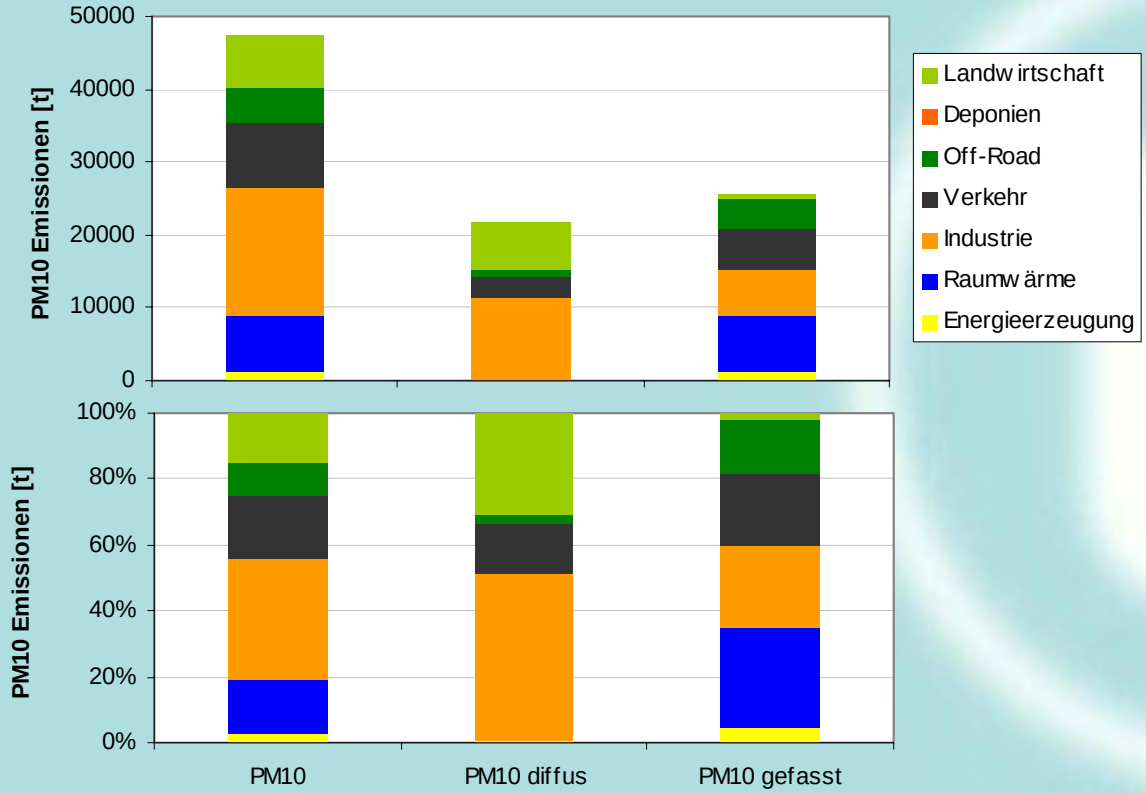
Emissions

Emissions of primary PM10 in Austria, 2002

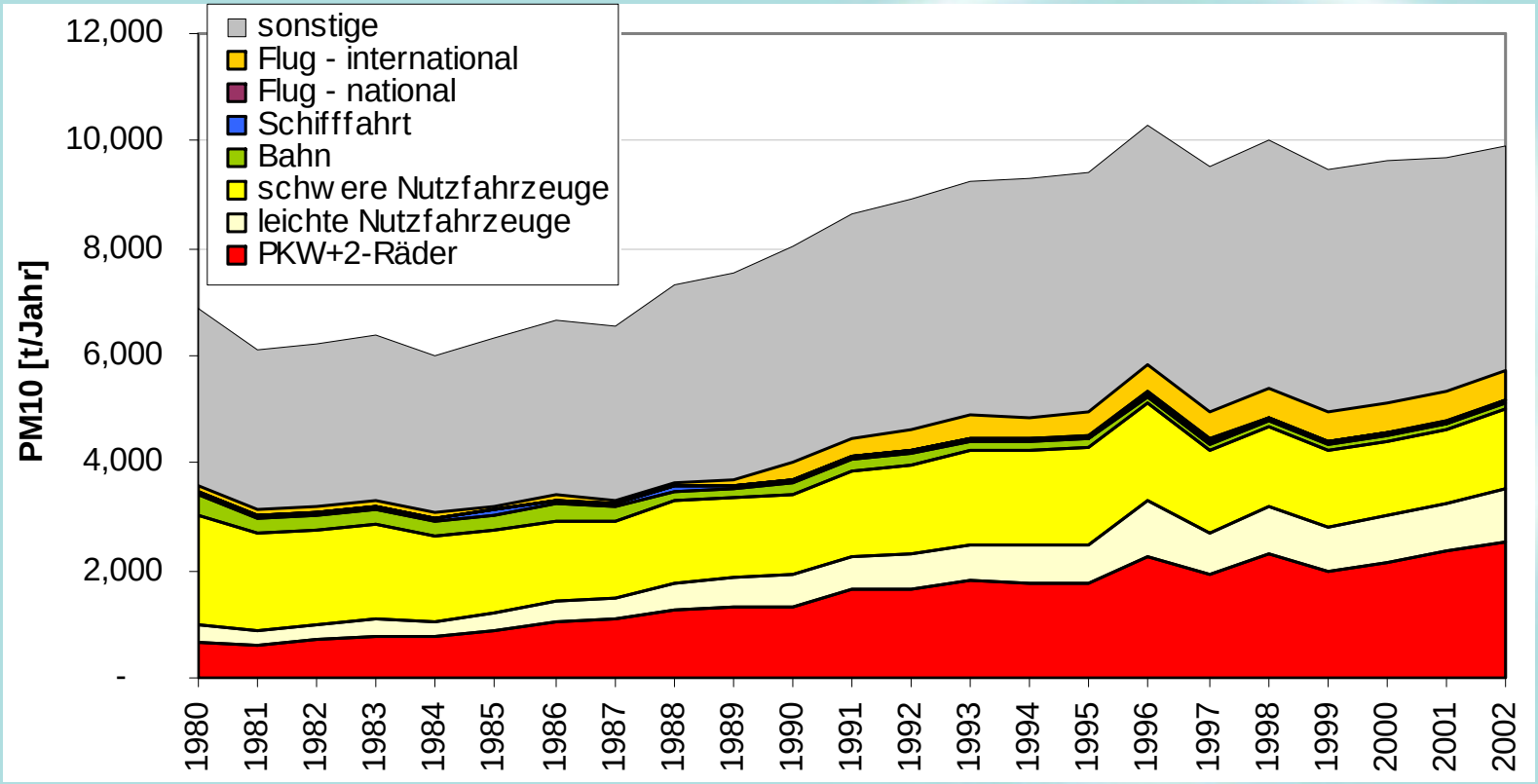


but:

- Emission shares do not correspond to shares to ambient levels
- Emissions of precursors: NOx, SO_2 und NH_3

Emissions

Trend of PM10 emissions from traffic



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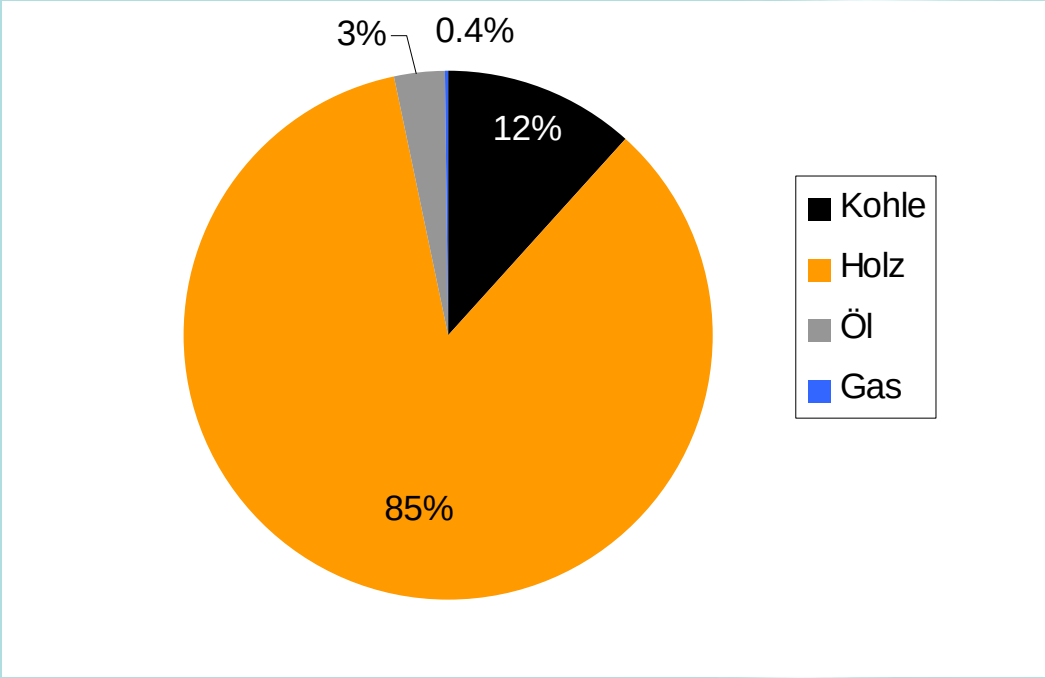
Emissions

PM10 emissions from domestic sector in At



Abatement options

Statuserhebungen for PM10 by the Umweltbundesamt:

- Lienz (2003)
- Unterinntal (2004)
- Imst (2005)
- Klagenfurt (2003)
- Wolfsberg (2005)
- Wien (2004)
- Nordburgenland (u.a. Eisenstadt; 2004)
- Oberwart (2005)
- Niederösterreich (2005)

Main sources for abatement

- Traffic (cars, & HDV) – technical and non-technical measures (e.g., fiscal)
- Domestic sources (95-98% solid fuels)
- Construction work
- Industry (including fugitive)
- Precursor emissions (NOx, SO_2 and NH_3)

Conclusions

- PM10 levels in Austria exceed legally binding limit values
- No clear trend in recent years
- Strong interannual variations
- North eastern parts of Austria: Strong contribution of LRT
- Alpine basins and valleys: Dominating part is ‚home made'
- Main sources of prim. PM in Austria are traffic, domestic heating and industry
- Further abatement measures are indispensable