

# PMinter

MARIBOR, 18. - 19. SEPTEMBER 2013

[www.pminter.eu](http://www.pminter.eu)



## Feinstaubfreies Klagenfurt ?

Maßnahmen zur Verringerung der Luftbelastung in der Landeshauptstadt Klagenfurt am Wörthersee

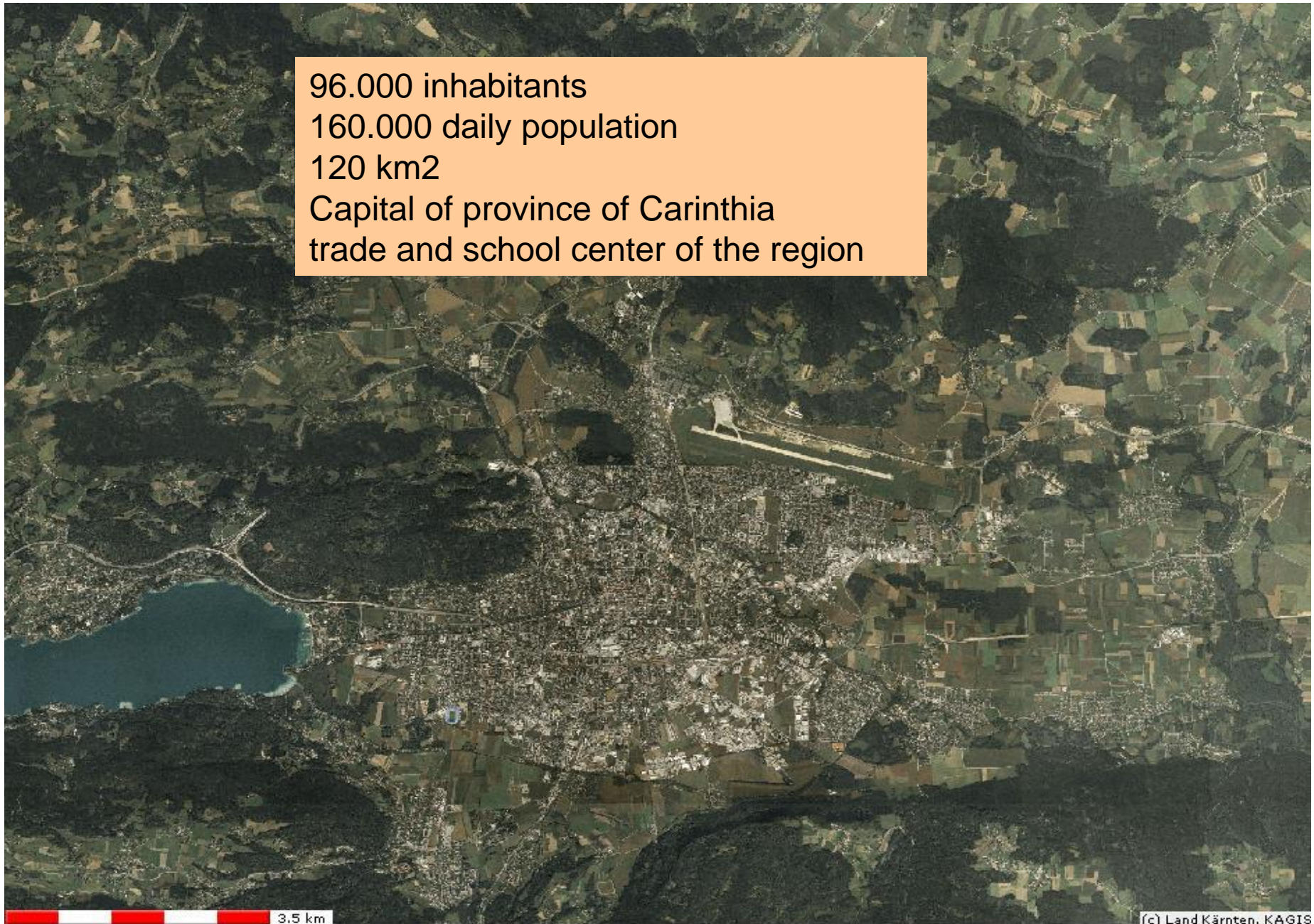


Wolfgang Hafner  
City of Klagenfurt, Dep. Environment Protection

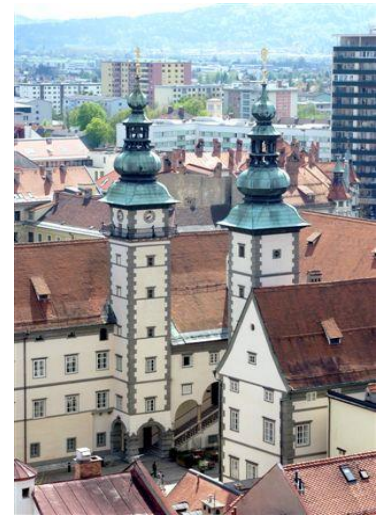
Maribor, 19.09.2013

PMinter

96.000 inhabitants  
160.000 daily population  
120 km<sup>2</sup>  
Capital of province of Carinthia  
trade and school center of the region



# *City of Klagenfurt on Lake Wörthersee*

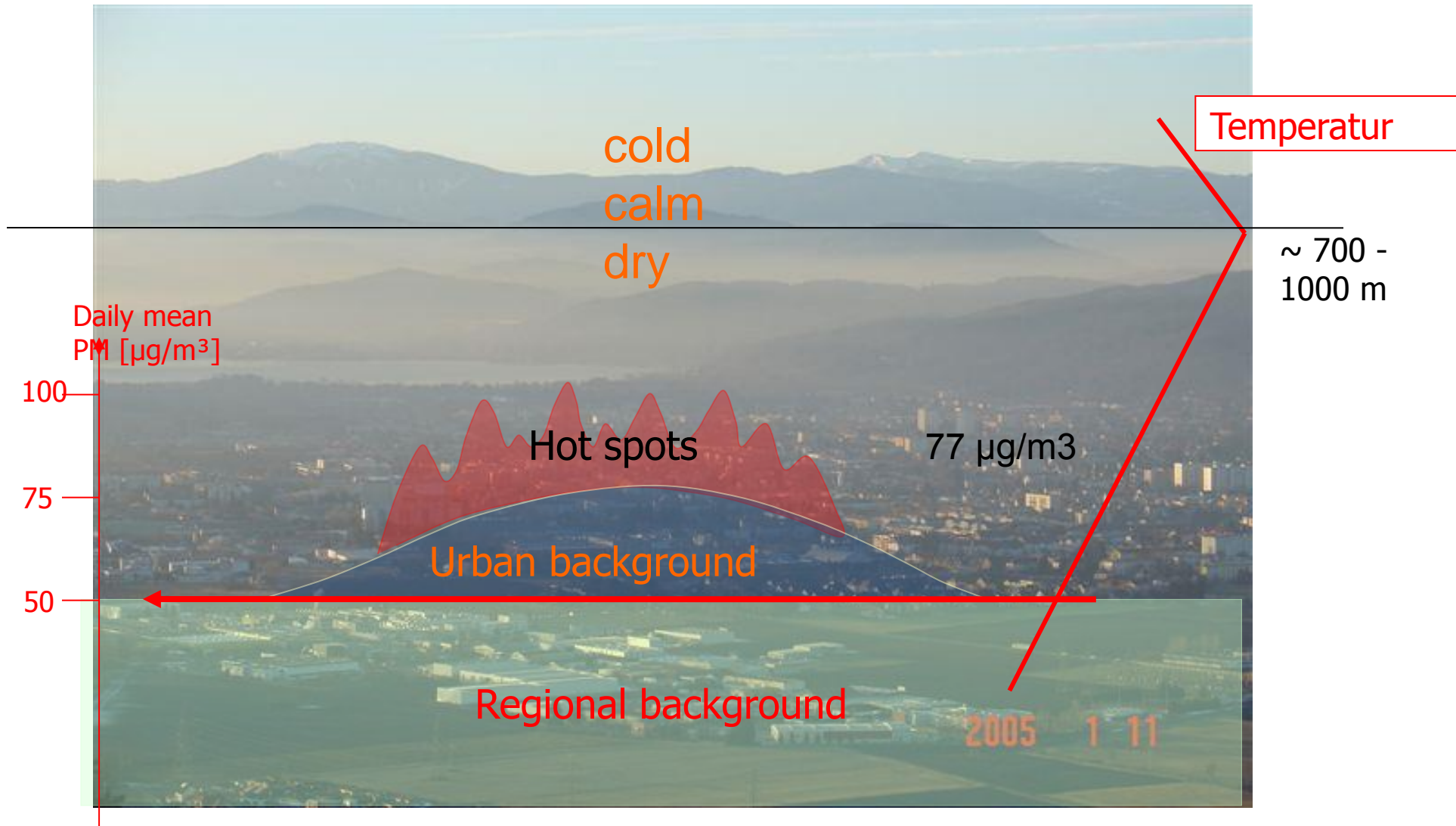




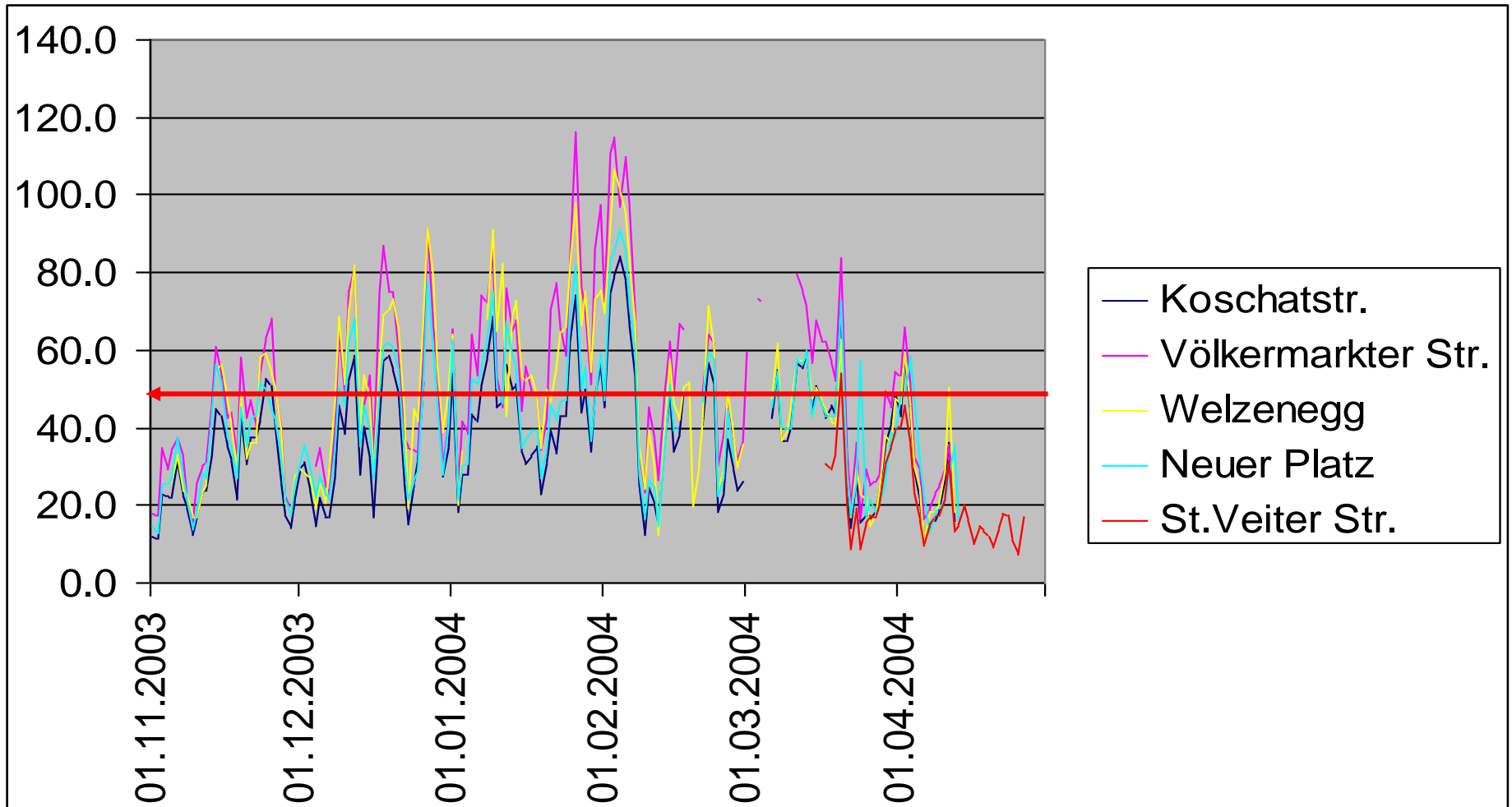
PM 10 Daily mean 22 – 32  $\mu\text{g}/\text{m}^3$

Samstag, 12. 11. 2005

# Fine Dust (PM 10 ) in Klagenfurt



# Fine Dust (PM10) Nov 03 – April 04





## Layman's Report

### KAPA GS

Klagenfurts Anti-PM10-Aktionsprogramm  
mit Graz und Südtirol

LIFE04 ENV/AT/000006

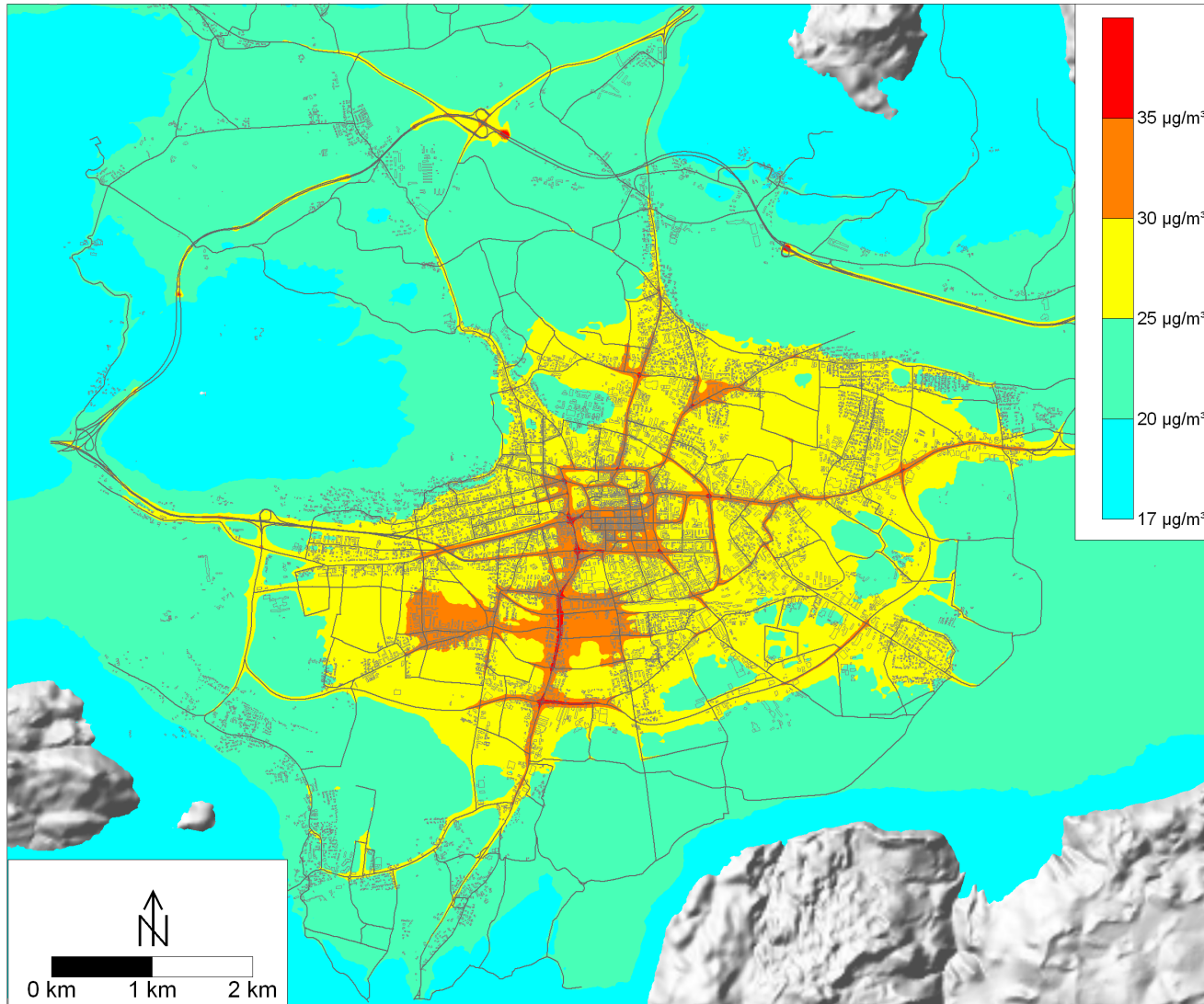
# EU-Project KAPA GS

[www.kapags.at](http://www.kapags.at)

2004 - 2007



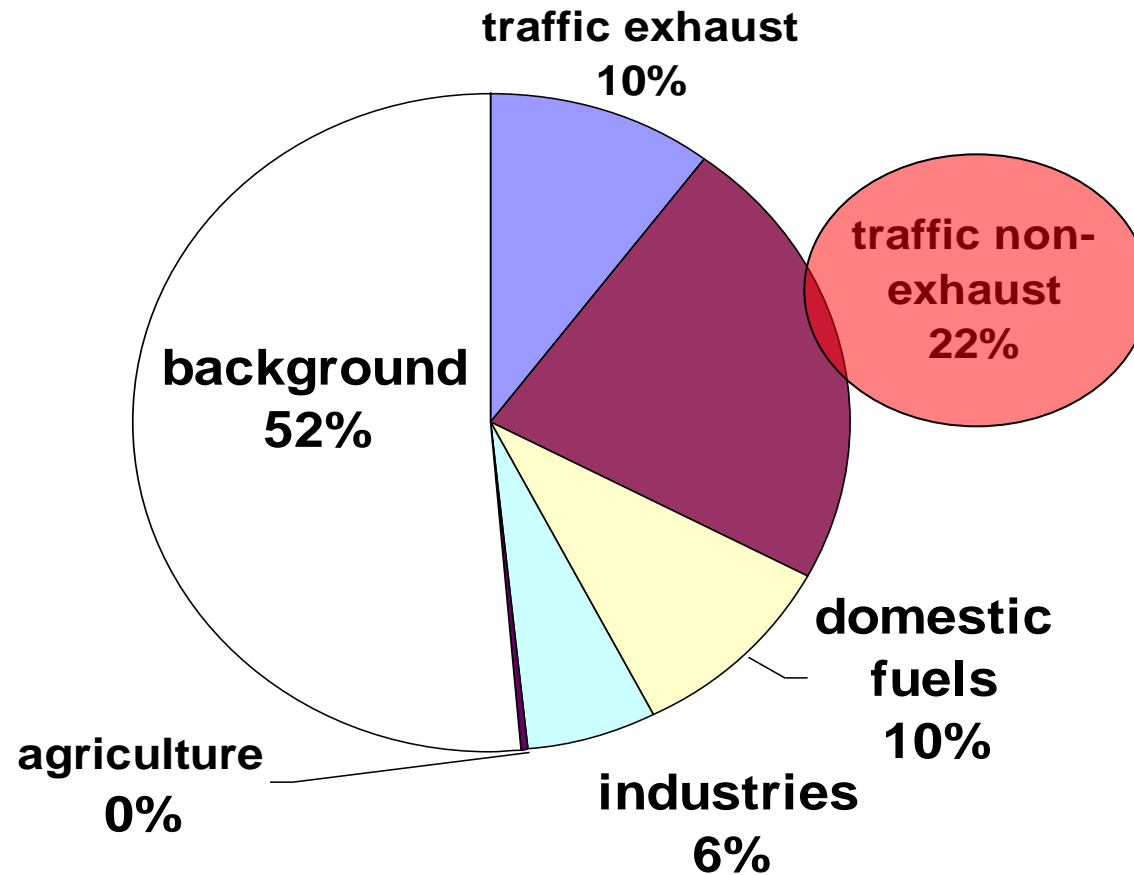
# Modelling 2005 PM 10 annual mean





# Sources apportionment (PM 10)

## Klagenfurt - Völkermarkter Str., annual mean



# LIFEplus-Project CMA+



**Versuchsstrecke  
für eine saubere Luft**



Feinstaubkleber  
**CMA+**  
2009 - 2012

**Klagenfurt**  
Kärnten AUT

**Lienz**  
Osttirol AUT

**Bruneck**  
Südtirol ITA

[www.life-cma.at](http://www.life-cma.at)

**vti**

**VOM-THO  
TU-GRAZ**

**Chemson**

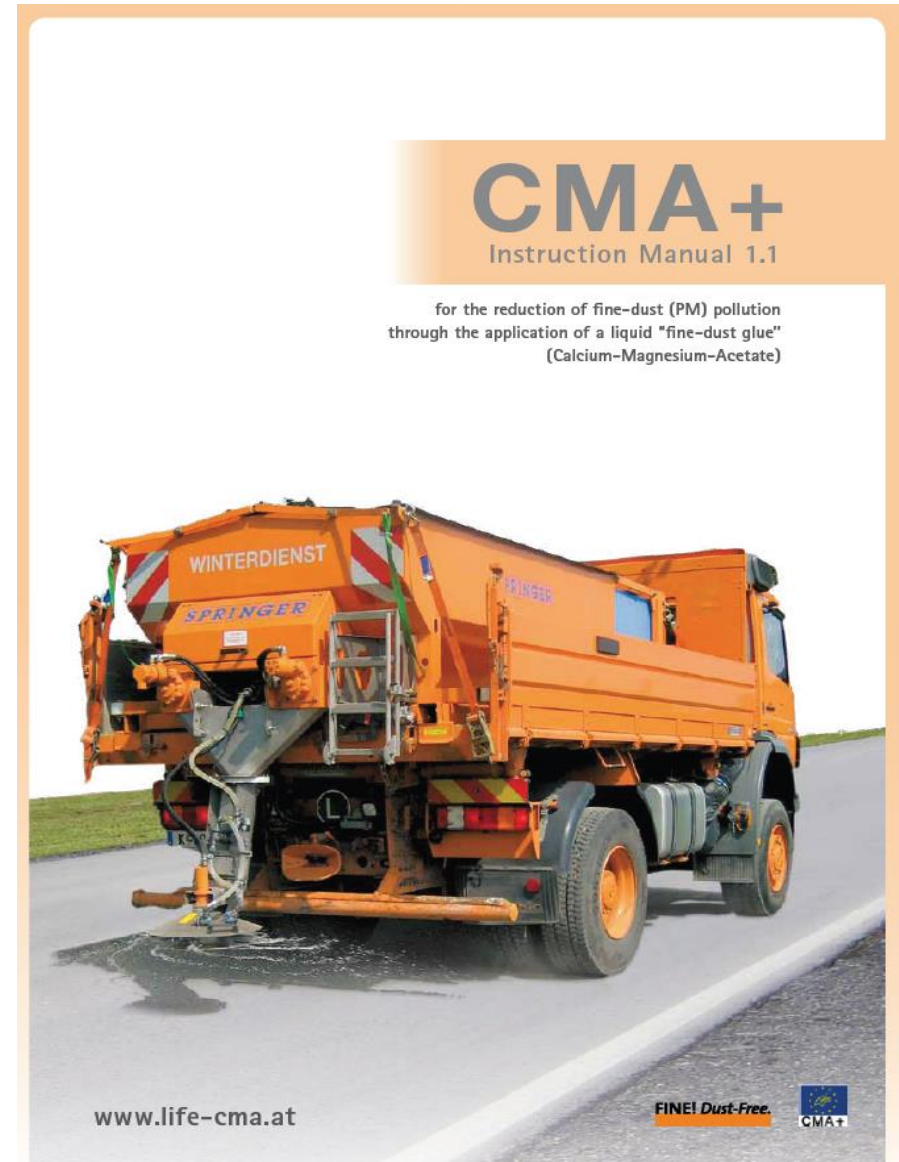


PM10 reduction by the application of liquid Calcium-Magnesium Acetate (CMA) in the Austrian and Italian cities Klagenfurt, Bruneck and Lienz

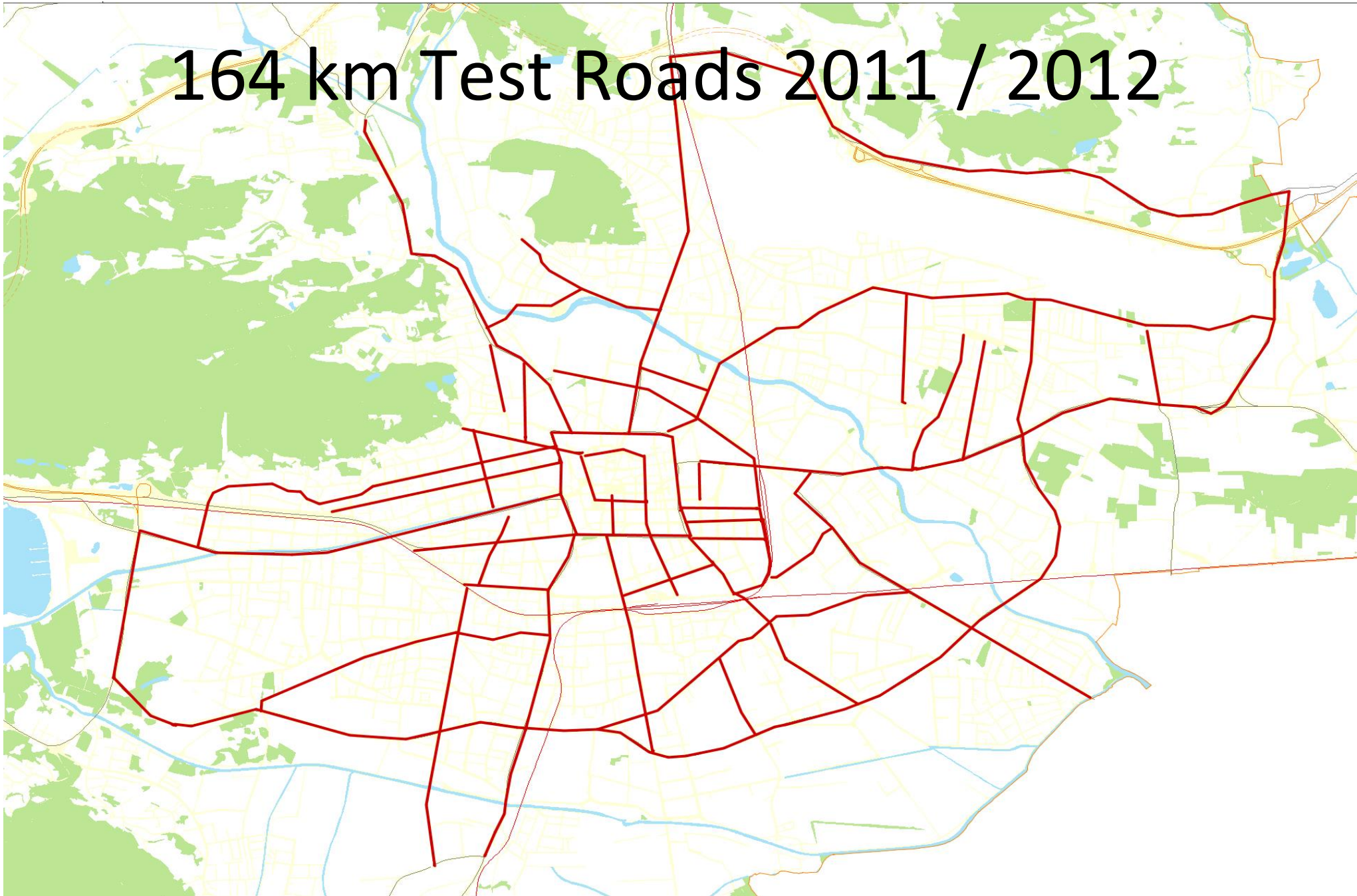
1.01.2009 – 30.09.2012

# Objectives of CMA+

- Development and demonstration of a standard methodology for the application of CMA as fine dust binder in winter, for dust binding in summer and as de-icing agent
- Dosage, time and frequency have to be clarified as well as issues of traffic safety
- Instruction Manual for European Municipalities

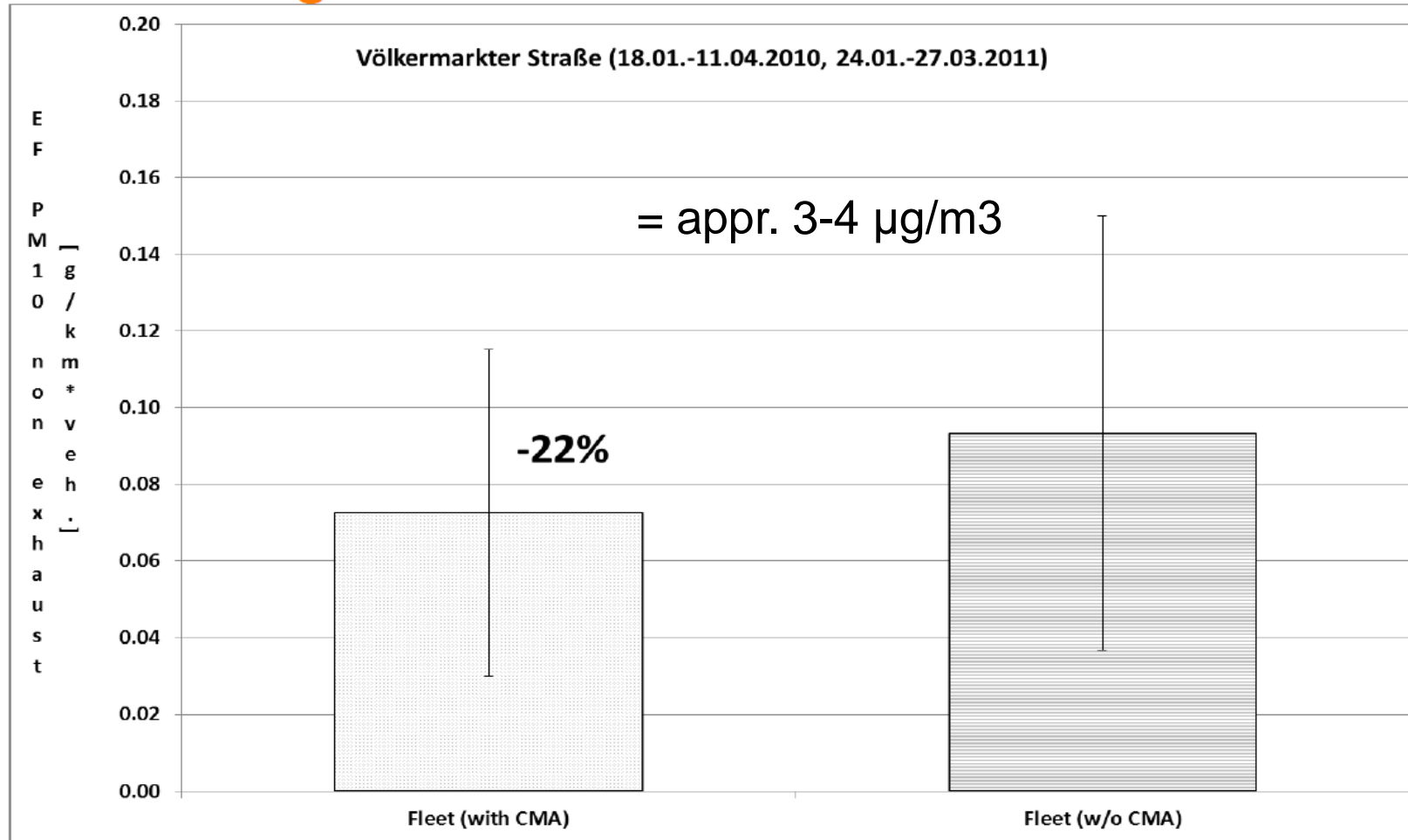


# 164 km Test Roads 2011 / 2012





# Results-Klagenfurt

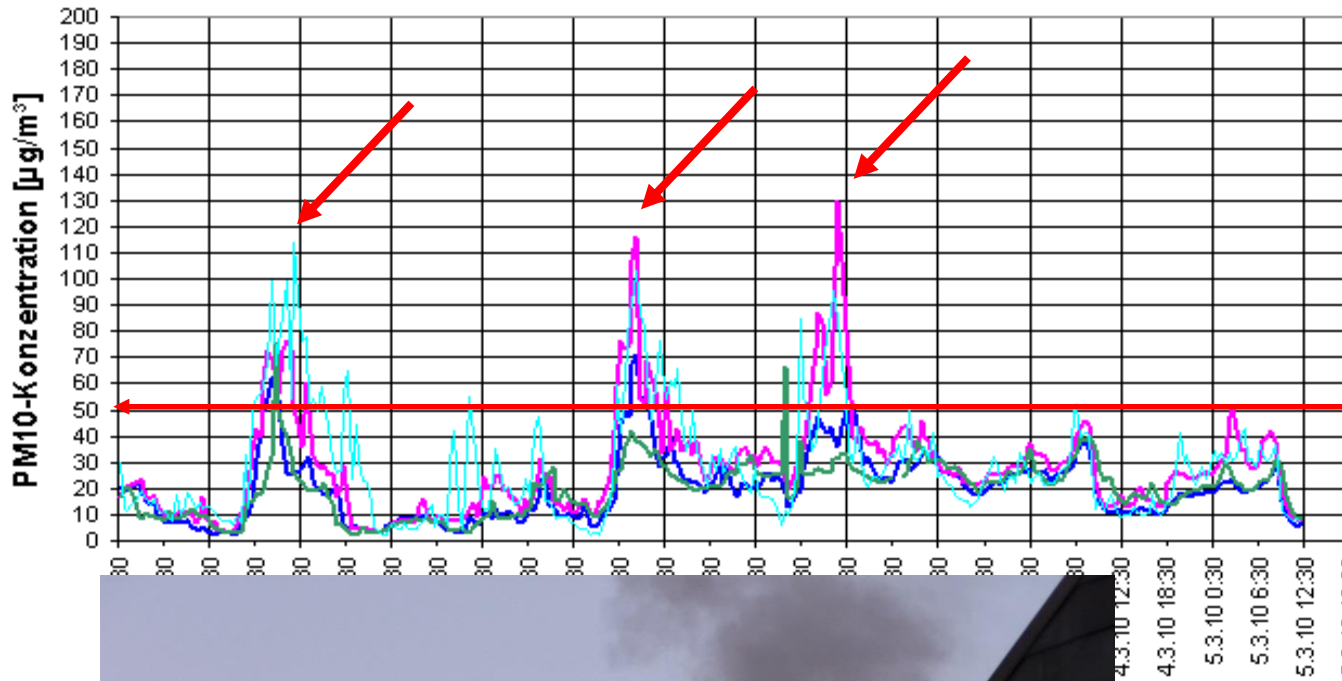


# Legal regulations (IG-L Verordnungen)



# Feinstaubhalbstundenmittelwerte (PM10) in $\mu\text{g}/\text{m}^3$

(erstellt aus teils ungesichteten Daten)



Operationelles  
Programm  
Slowenien-  
Österreich  
2007-  
2013  
Interreg  
Projekt



## PMinter

Interregionale Wechselwirkung von Maßnahmen zur Reduktion von Hausbrand und Verkehr mit der Feinstaubbelastung im Grenzgebiet Slowenien-Österreich



# Wood combustion in single stoves

# EU-Projekt PMinter

**Interregionale Wechselwirkung von Maßnahmen zur Reduktion von Hausbrand und Verkehr mit der Feinstaubbelastung im Grenzgebiet Slowenien-Österreich**

- Förderprogramm INTERREG IV - Operationelles Programm Slowenien-Österreich 2007-2013
- Projektdauer: 01.07.2010 – 31.12.2013
- Lead Partner: Landeshauptstadt Klagenfurt am Wörthersee
- Projektpartner: Magistrat Marburg  
Amt der Kärntner Landesregierung  
Technische Universität Graz  
Institut für öffentliche Gesundheit Marburg  
Amt der Steiermärkischen Landesregierung  
Universität Marburg
- Gesamtkosten: ca. 2,5 Mio. Euro, davon 85 % EFRE-Förderung

Homepage: [www.pminter.eu](http://www.pminter.eu)



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Operation part financed by the European Union  
European Regional Development Fund



Umwelt.Klagenfurt am Wörthersee  
Die Landeshauptstadt





# Pminter – actions in Klagenfurt

- Monitoring and calculation of wood smoke in the ambient air (Aethalometer measurements, chemical filter analysis)
- PM 10 emission measurements by TU Graz and chimney sweepers (Vereta)
- emission inventory
- improvement and update of KAPAGS air quality model considering chemical reactions (base 2010/ 2011) by TU Graz
- Air quality improvement by measures (domestic fuels and traffic)
- information and awareness raising of the population (focus domestic fuels)
- Optimization of air quality plan



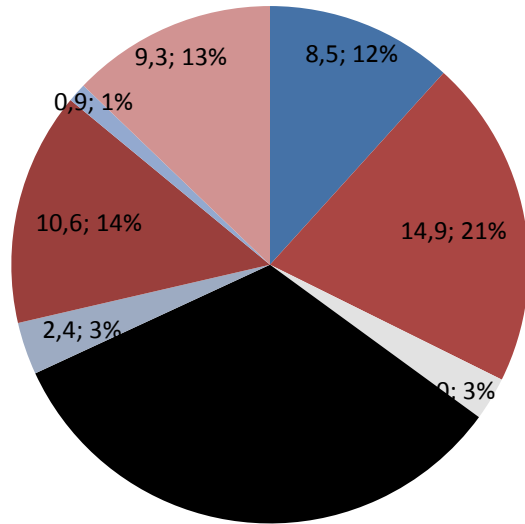
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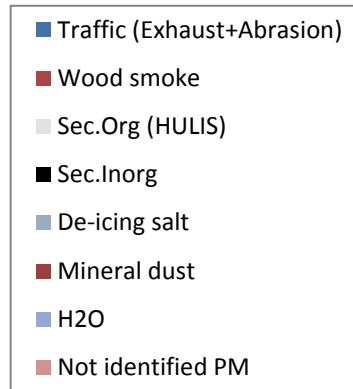


Umwelt.Klagenfurt am Wörthersee  
Die Landeshauptstadt

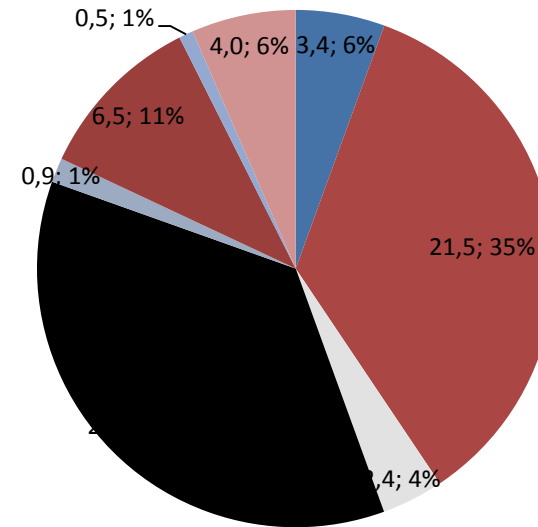




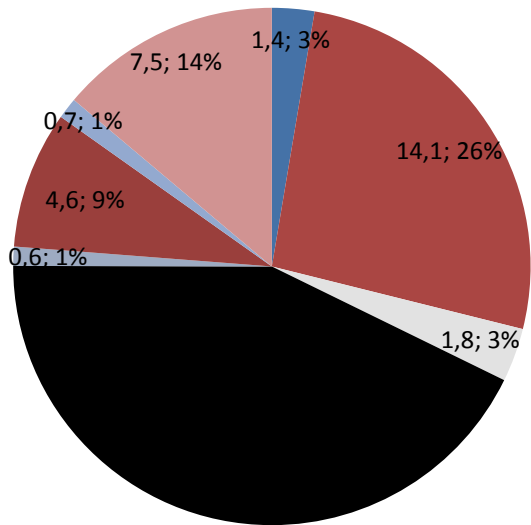
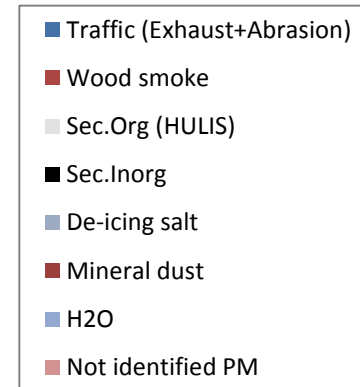
Klag. Völkemarkterstr.  
Winter 2011 (8 days)



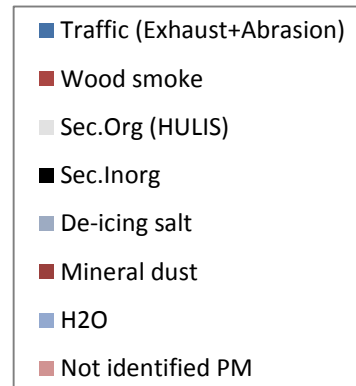
## Anteile an PM10 Quellen für ausgewählte Periode, Werte angegeben als Absolutwert ( $\mu\text{g}/\text{m}^3$ ), Relativwert (%)



Ebenthal - Zell  
Winter 2011 (8 days)

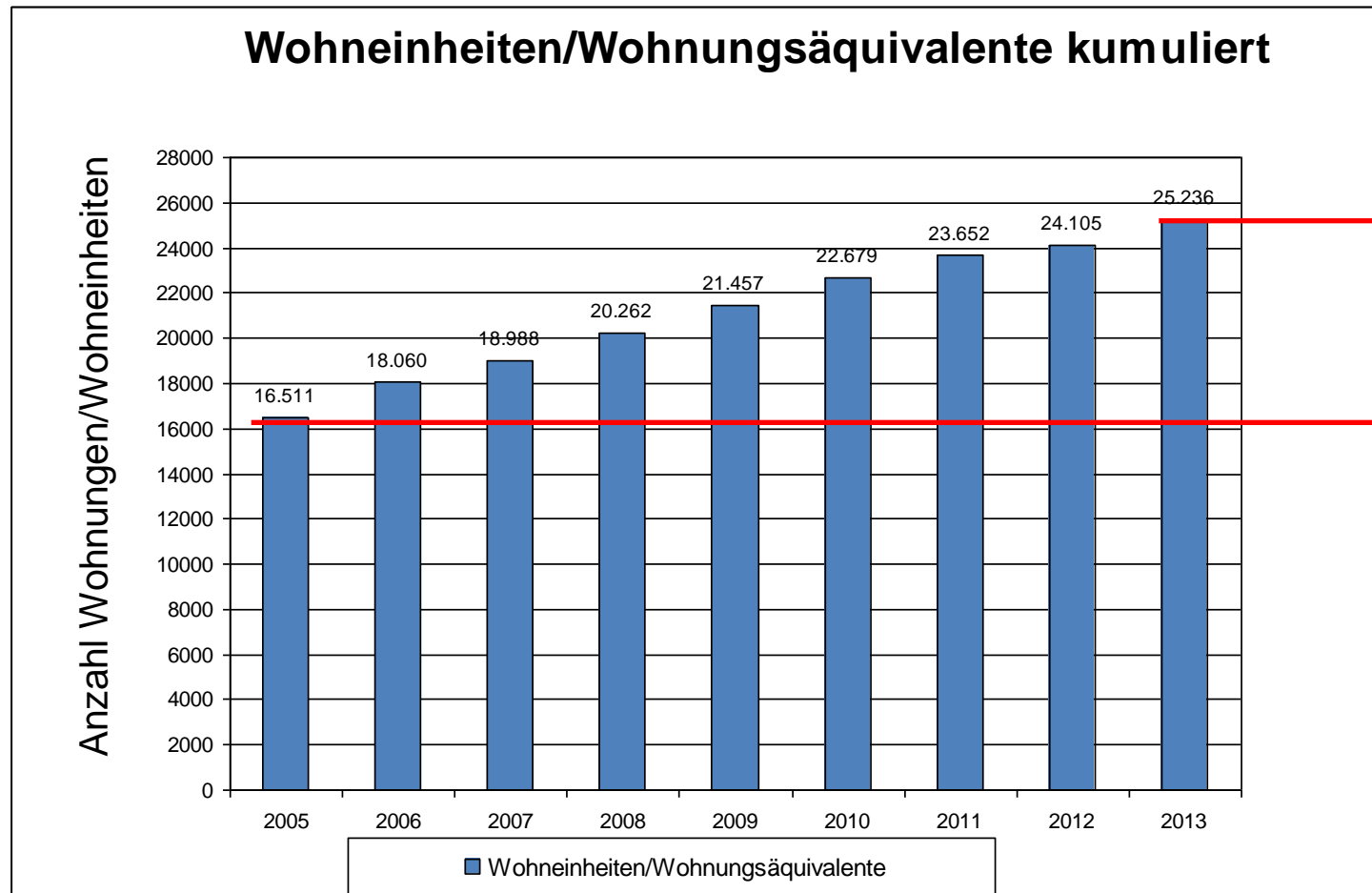


Klag. Ost (Limmersdorf)  
Winter 2011 (8 days)



Holzrauch dominiert in der Städtische Hintergrund Messstellen in Kärnten (KO, EZ), wobei Absolut gesehen wir haben die gleiche Menge an Holzrauch-Feinstaub in der Stadt und definitiv höher am Land. Sekundär inorganische Stoffe ( $\text{NH}_4\text{NO}_3$  und  $(\text{NH}_4)_2\text{SO}_4$ ) – also Feinstaubfraktion welche dem Ferntransport zugeordnet werden konnte ist tatsächlich im gesamten gebiet gleich, wobei an der Hintergrund Messstelle ist anteilmäßig am stärksten, da die andere quellen sind dort weniger deutlich.

# current domestic heating connections



**+ 53%**

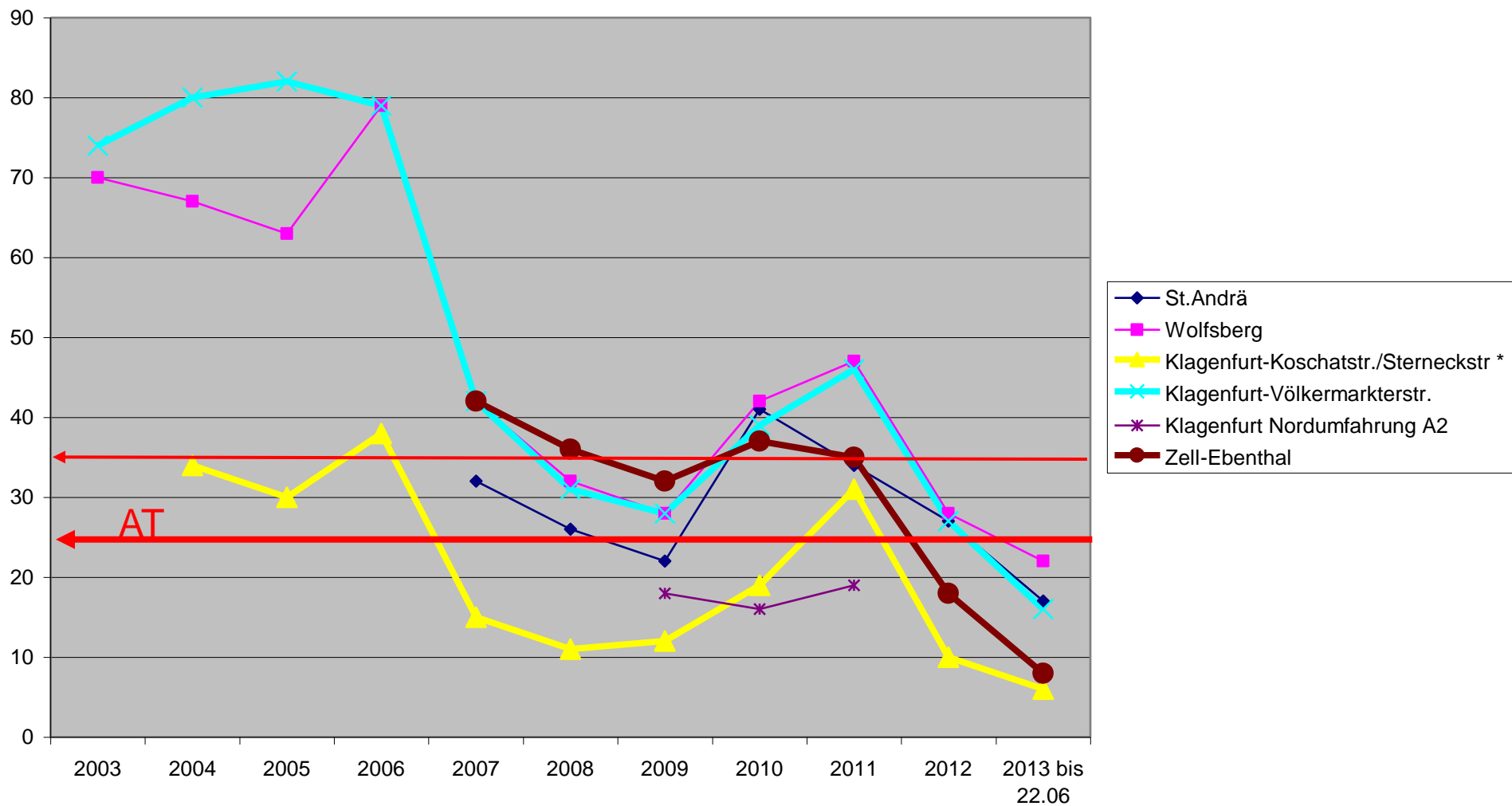
# Air Quality Action Plan for Klagenfurt

20 measures with 245 actions

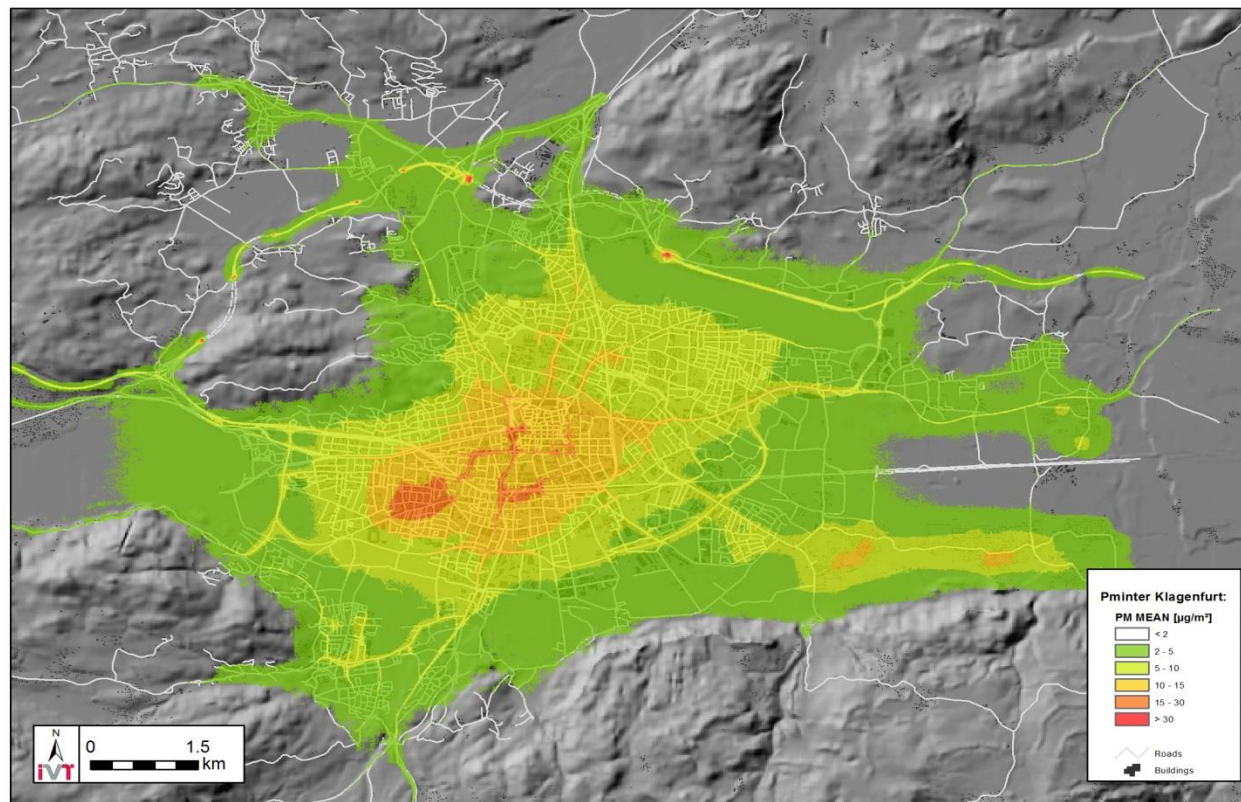
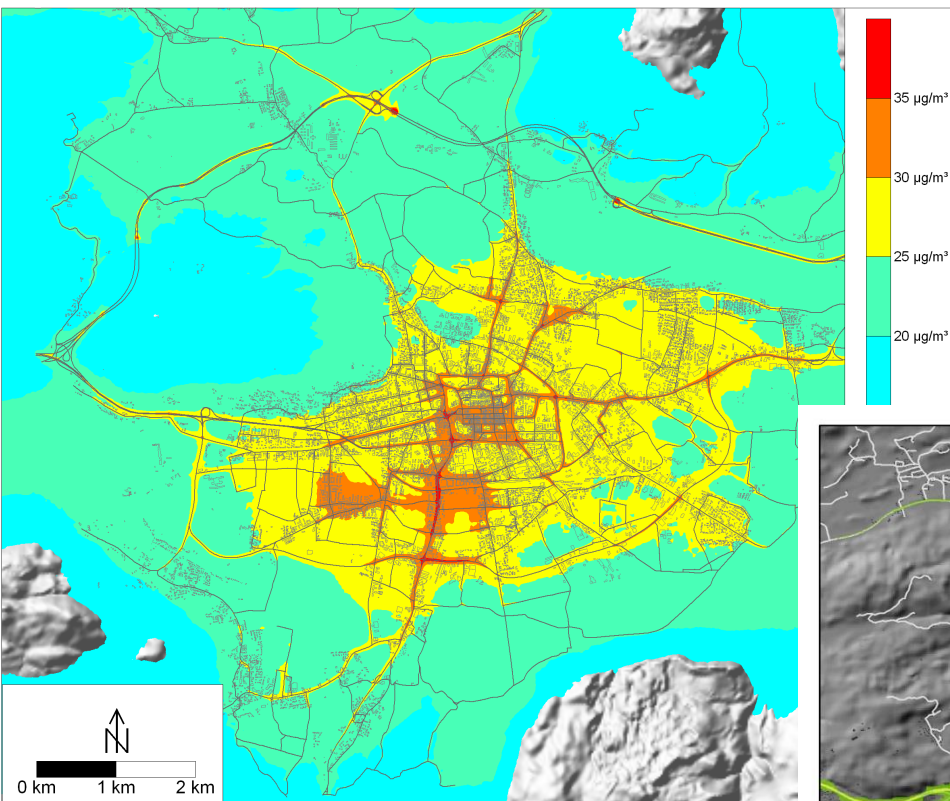
(PM10 and NO2)

- ✓ CMA-Application
- ✓ Improved street cleaning & winter service (reduced sanding)
- ✓ Park & Ride West and East
- ✓ Efficient parking fee system
- ✓ cheaper monthly tickets for public transport (26 € instead of 39 €)
- ✓ Refurbishment of 2400 municipal apartments (district heating instead of single stoves)
- ✓ Extension of district heating (from 16.500 to 25.000 connections)
- Replacement of old district heating plant (oil) by new biomass-power plant and natural gas
- Renewal of busfleet Euro 5, EEV-Standard, 1 e-bus
- ✓ Traffic ban of inner city road
- Environmental zones ?
- Priority for public transport (e.g. bus lanes), extension of public transport
- ✓ further EU-Projects, e.g. PMinter (domestic fuels), REZIPE & CEMOBIL (E-mobility) , CoP, SEAP\_ALPS (Climate protection)
- ✓ Public relations

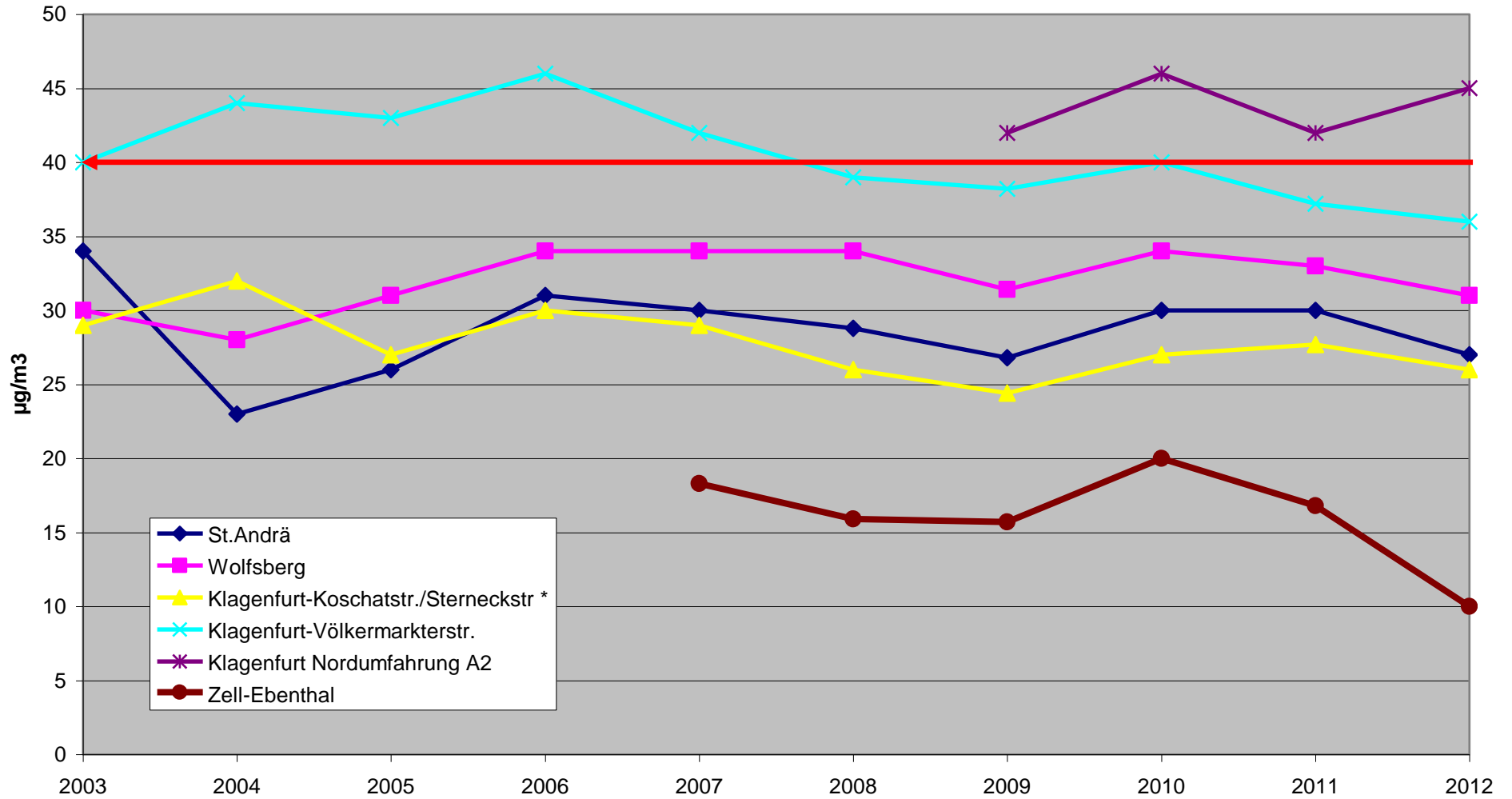
# PM10 - Number of days exceeding the daily mean limit value



# PM 10 annual mean 2005 / 2011



# NO2 - annual mean



# SUMMARY

EU-limits for NO<sub>2</sub> and PM10 / PM2.5 can be achieved by

1. Finedust binder (CMA) & street cleaning
2. Extension of domestic heating network and reduction of domestic fuels (wood combustion) by new Biomass-CHP
3. Renewal of public busfleet
4. Stop for traffic increase (efficient parking fee system, priority for and extension of public transport, walking and cycling, shared space, e-mobility, car-sharing)



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Umwelt.Klagenfurt am Wörthersee  
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# The e-mobile future of Klagenfurt

## 2 EU-project's

**REZIPE:** Renewable Energies for Zero Emission Transport in Europe

**CEMOBIL:** CO2-neutral Electromobility for the reduction of PM10, NO2 and CO2 in Klagenfurt



Wolfgang Hafner, City of Klagenfurt, Head of Department of Environment

[feinstaubfrei.at](http://feinstaubfrei.at)

[life-spas.at](http://life-spas.at)

[life-cma.at](http://life-cma.at)

[pminter.eu](http://pminter.eu)

[rezepte.eu](http://rezepte.eu)

[cemobil.eu](http://cemobil.eu)

[citiesonpower.eu](http://citiesonpower.eu)

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