

UFIPOLNET: Purpose – Partner - Project



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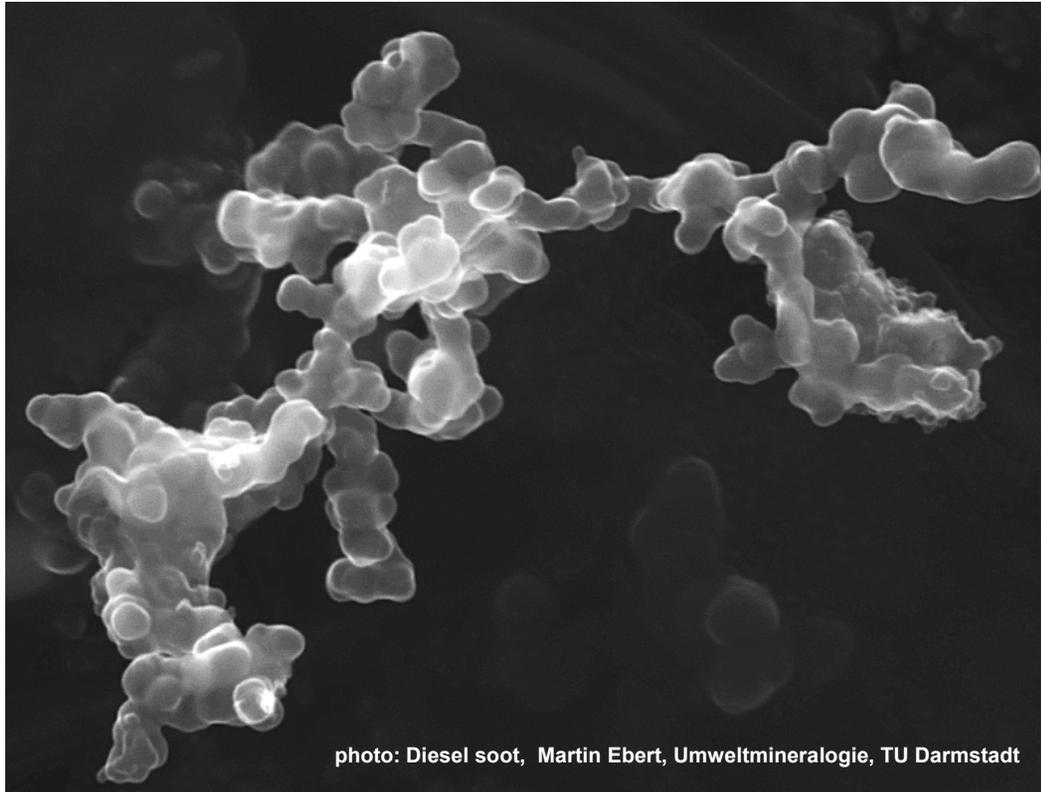
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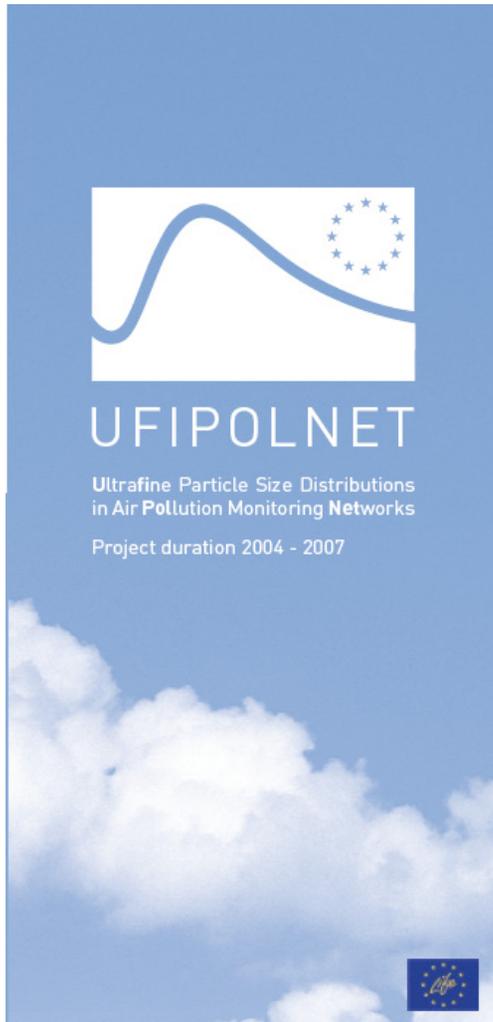


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UFIPOLNET



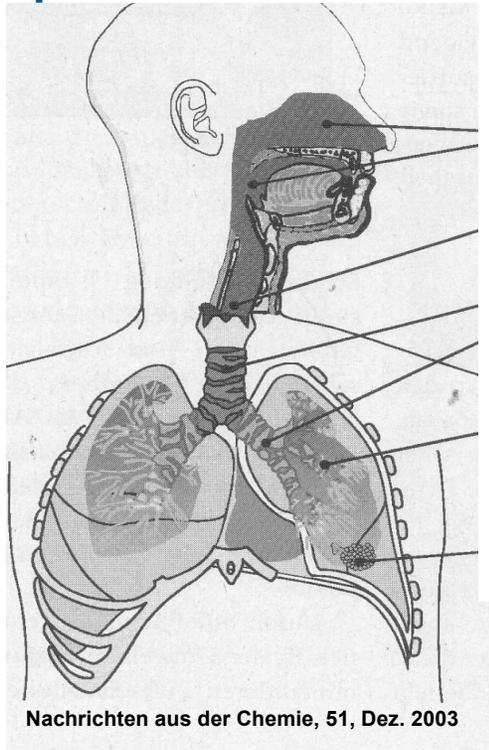
UFIPOLNET

Ultrafine particle size distributions
in air **pollution** monitoring **networks**

- EU LIFE Environment project
- 12-2004 – 3-2008 (11-2007)
- 868 kEUR total budget

Purpose

size dependent depth of penetration of particulate matter into human



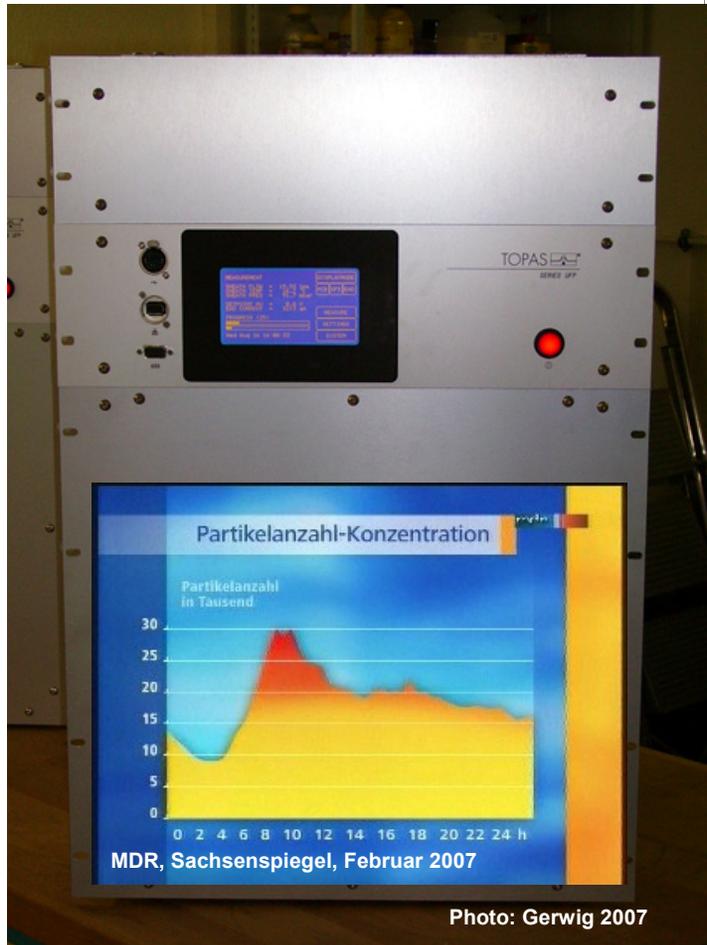
PM₁₀ (< 10 μm)

- show **adverse health effects** in Epidemiological studies
- **EU directive EU/1999/30 to reduce PM₁₀** is in force

Ultrafine Particles (< 100 nm = UFP):

- **Particle number concentrations** of UFP partly **raised** during winter periods 1991 – 1999 in Erfurt (Cyrus et al. 2002) and 2001 - 2005 Dresden (Löschau 2006).
- **toxicological effects**
- **EU wants more spatial and time scale information**
- **Today: measured only in a few routine measuring stations** in Europe

Purpose: Objectives



Ultrafine Particles size distributions

- create an **easy to use + reasonably priced instrument**
- for **routine measuring stations**
- spatial and time scale information:
5 years at 4 places

Partner



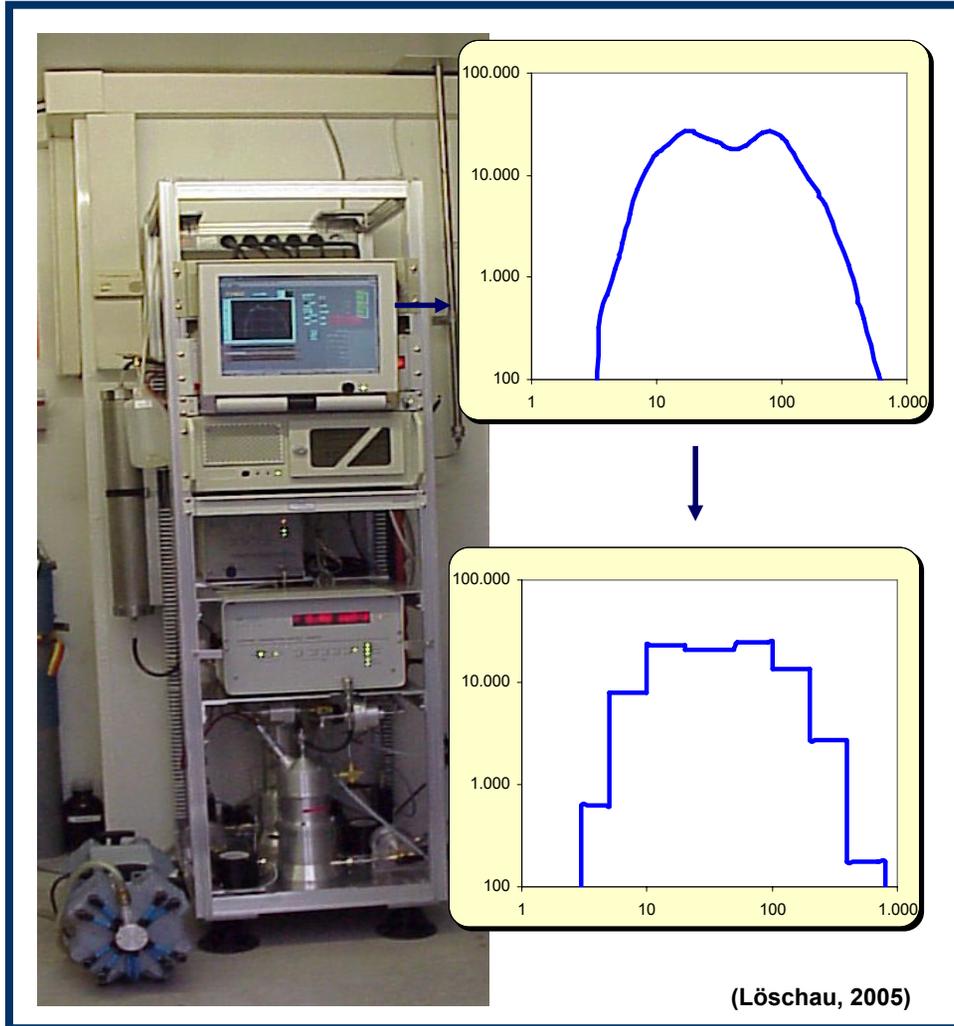
- **7 partners**
- **3 nations: CZ, SE, DE**
- **4 organization types:**
 - research institutes
 - university
 - monitoring networks
 - big company
 - small company

Partner



- **LfUG** Saxon State Agency for Environment and Geology, Dresden, Germany and UBG – Staatliche Umweltbetriebsgesellschaft, Radebeul, Germany
- **IfT** - Leibniz-Institute for Tropospheric Research, Leipzig, Germany
- **TOPAS** GmbH, Dresden, Germany
- **ITM** – Department of Applied Environmental Science, Stockholm University, Stockholm, Sweden
- **GSF** National Research Centre for Environment and Health, Neuherberg, Germany
- **CHMI** – Czech Hydrometeorological Institute, Prague, Czech Republic
- **TSI** GmbH, Aachen, Germany and Shoreview, Minnesota, USA

Partner LfUG: Experience



- **2001 - now in Dresden**

- **DMPS =**
Differential Mobility
Particle Sizer

- **Built by IfT**

- **3 - 800 nm (2 DMPS)**

Reduction for database
of routine measuring
network:

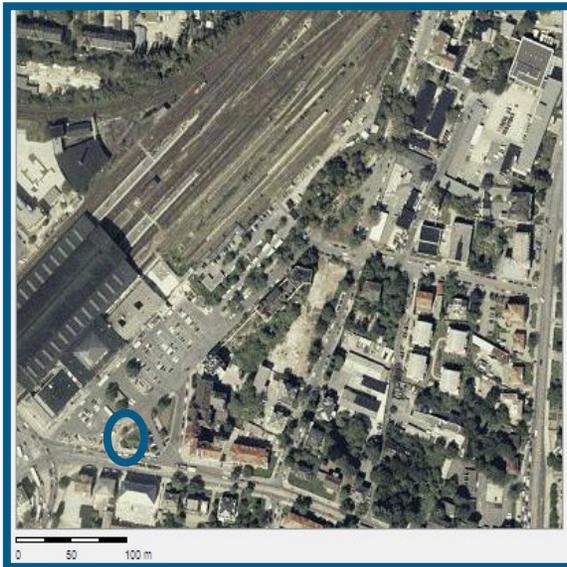
- From minutes to **half hour average**

- **8 Particle size classes**



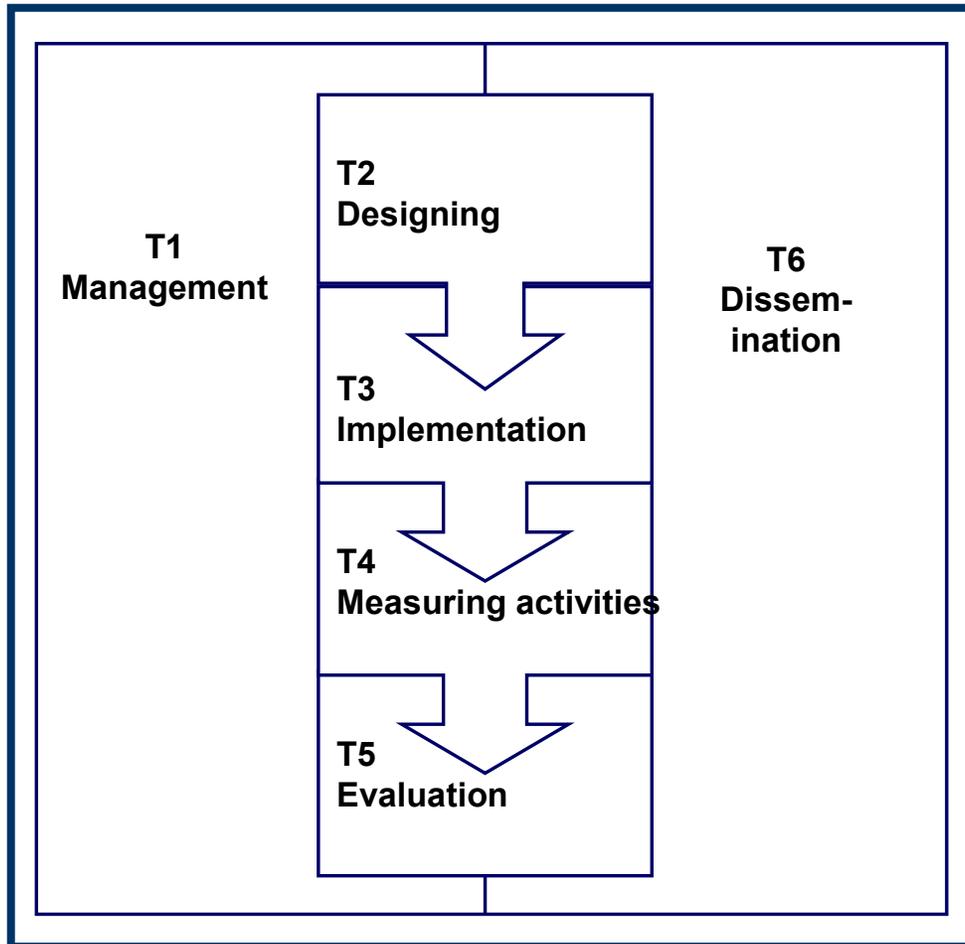
Partner LfUG: Sampling station

Schlesischer Platz, 50,000 cars per day, 8 % heavy duty vehicles



Dresden, Schlesischer Platz 2007, photo: Gerwig

Project



Project Management: 6 Tasks

1. Management
2. Designing
3. Implementation
4. Measuring activities
5. Evaluation
6. Dissemination

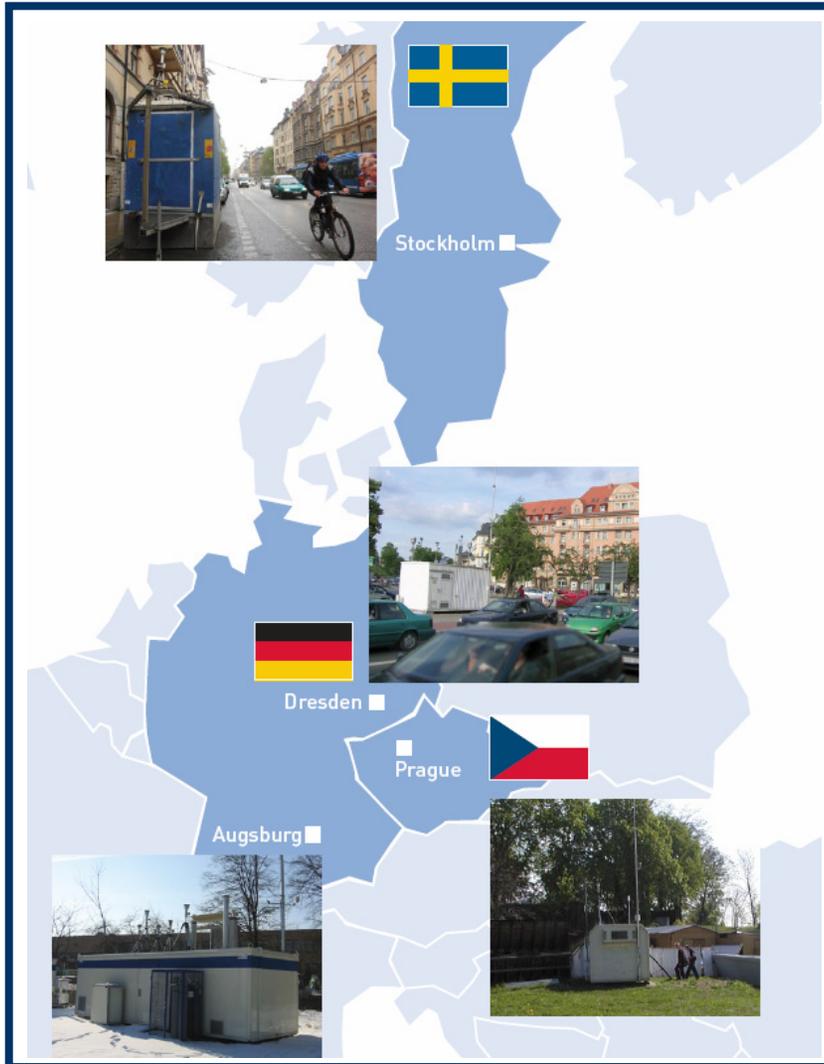
Project result: UFP 330



Dresden: UFP 330, TOPAS (middle)
+ reference Twin-DMPS, IFT (right),
07.02.2007, photo: Gerwig

- **6 Particle size classes**
>20|>30|>50|>70|>100|200-800 nm
- **half hour average** in database
- **Implemented** in routine
measuring stations
- **Same sampling** conditions
- **comparison** with reference
instrument for sum of particles
and single ranges **good**. Next
comparison Jan-2008
(long term stability)

Project result: 4 measuring stations



Stockholm:
Hornsgatan (street canyon)

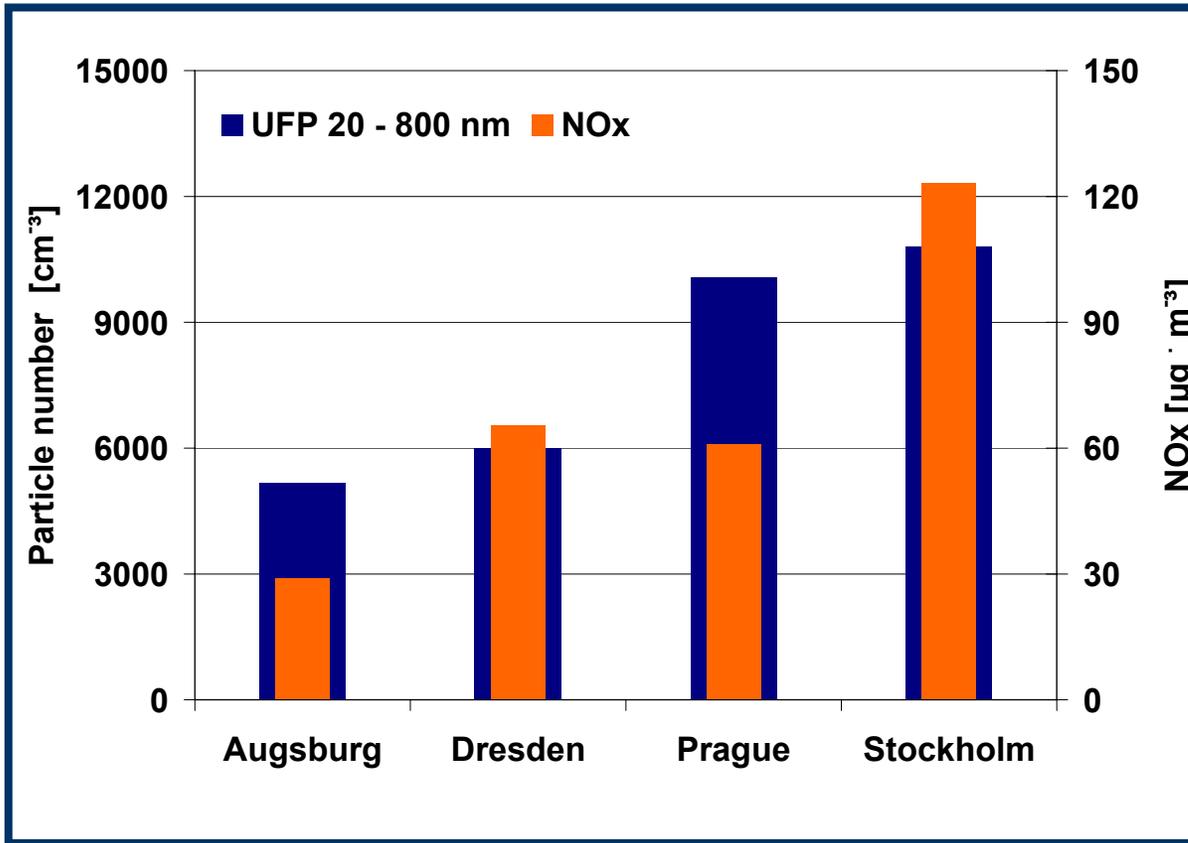
Dresden:
Schlesischer Platz (main crossing)

Prague:
Strahovský tunnel (above tunnel exit)

Augsburg:
Friedberger Straße (urban background)

Project result: 4 measuring stations compared

Mean **particle number** concentrations and **NOx** (1 hour basis), June 2007



UFP particle number concentrations

Augsburg < Dresden

Stockholm = 2 * Dresden

NOx

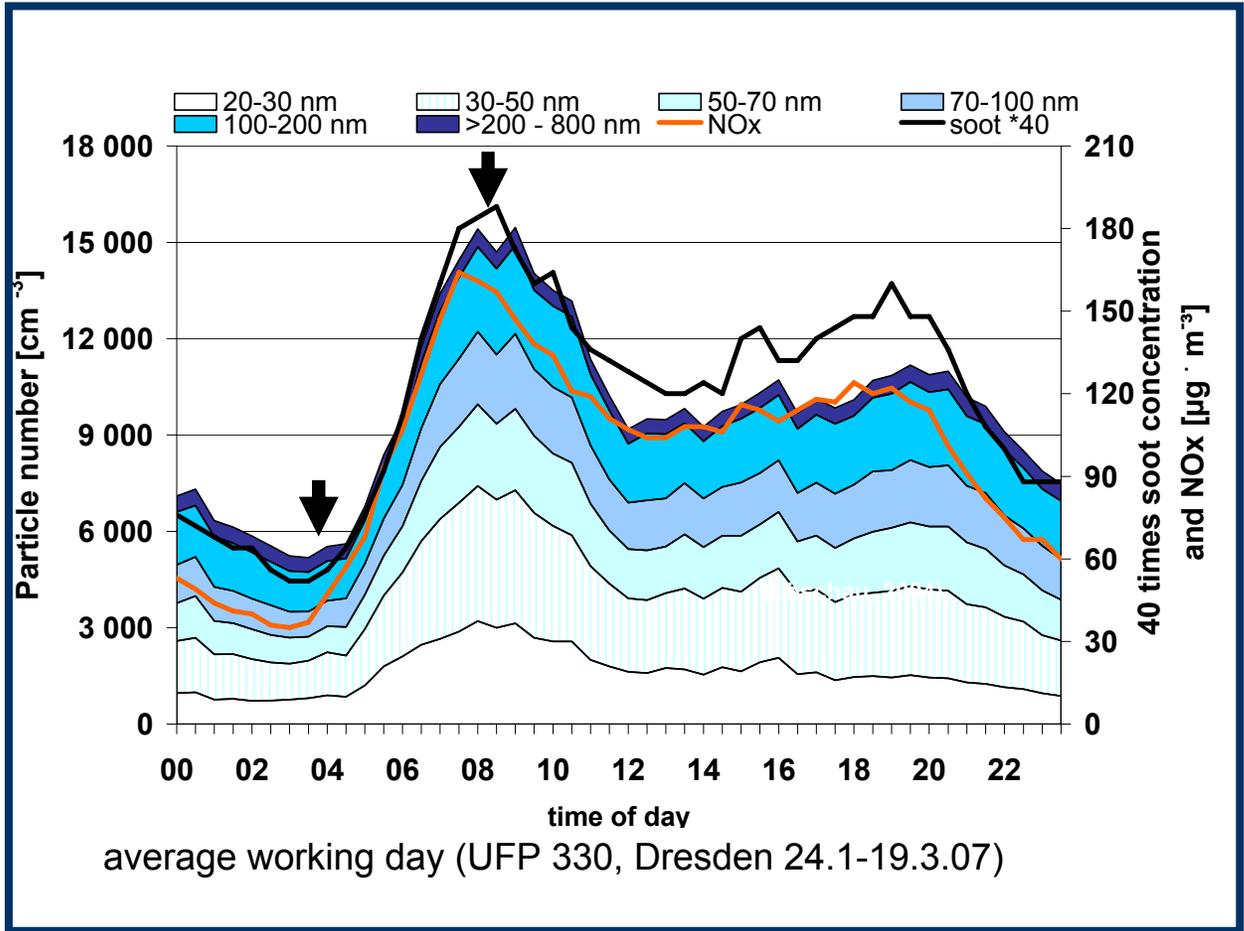
Prague = Dresden

Stockholm = 2* Dresden

Augsburg = 1/2 Dresden

Project result: Particle size distribution

Average working day (Mo-Fr) Dresden: UFP, NOX, soot, (24/01-19/03/2007)



Particle size distributions 20 – 800 nm

- Average working day:
Minimum 3:00 h
Maximum 8:00 h
- particle number concentration during average working day shows **similar pattern like NOx and soot**

SUMMARY

- UFIPOLNET: EU LIFE project with **7 partners** from **3 nations**
- Project Management: **6 Tasks**
- **UFP 330**: particle size distributions **20 – 800 nm**
- measurements in **Dresden, Augsburg, Stockholm, Prague**
- **comparison** with reference instrument **good**
- **Particle number concentration**
 - **highest** in Stockholm **street canyon**,
lowest in Augsburg **city background**
 - **particle number concentration** during average **working day**
shows **similar** pattern like **NO_x** and **soot**



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Thank you for your Attention!



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www.ufipolnet.eu



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