

European Network on New Sensing Technologies for Air Pollution Control and Environmental Sustainability - *EuNetAir* 

**COST Action TD1105** 

# WGs and MC Meeting at Cambridge, 18-20 December 2013

Action Start date: 01/07/2012 - Action End date: 30/06/2016

Year 2: 1 July 2013 - 30 June 2014 (*Ongoing Action*)

# Smart sensors for air quality monitoring in cities



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# **Issues:**

What do we mean by 'smart' and 'monitoring'?

## **Smart**

#### Individual sensor?

- Intrinsic performance (e.g. selectivity/sensitivity)?
- Sensor auxiliary characteristics (e.g. calibration or GPS/GPRS)?

#### Sensor network?

- Self calibration methods?
- Scale separation?

#### Information transfer?

Smartphone apps?

## **Monitoring**

#### **Emissions inventory?**

- Compliance vs. indicative?
- Fugitive emissions?
- Hazards?

#### Personal exposure?

- Cohort size?
  - medical vs. environment
- Conflict with emissions inventory?

### Measurement/model synergy?

- Network design/density?
- Measurement model "ratio"?

(Decide what we are trying to do?)



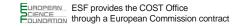
# **Sensors and sensor networks**

- Clear requirement for further fundamental sensor development,
  e.g. but not exclusively NO<sub>x</sub>, PM (but these are current needs).
- How to characterise sensors / sensor nodes: laboratory vs. field
- How good are sensors under realistic conditions?
  - ⇒ Concepts for QC performance indicators
- Low unit cost doesn't mean low total cost ..... (algorithm expense, network expense) the future?
- 'Smart' should mean smart use of networks/reference instruments/algorithms - not just sensor

Require sensor/sensor network metrics for different applications

 $reference \Rightarrow \Rightarrow indicative$ 





# Modelling (physical/statistical/numerical/machine learning)

- Use of sensor network models (e.g. LUR but also physical) to mapping for emission inventories and exposure.
- Use of sensor network models to define/optimise network deployments
- Innovative numerical approaches (share datasets?) improve mapping/sensor performance?
- Improve network configuration/calibration/QC

# **Technical aspects**

- Future proofing network sustainability? Sensors/technologies (e.g. comms)
- Network scalability/transferability
- Maintenance of data (metadata)





# **Delivering outcomes**

- How to get information from sensor networks
- How to USE the information to protect public health
  - How to harness 'engaging the citizen'?
  - Exposure management
  - Emission management
  - Epidemiology/health effects research (which metrics ?)
  - Put A/Q on same level as weather forecast alter societal behaviour...
  - Integrate institutional and informal networks ....

'Top down' definition of strategy

