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

## COST Action TD1105

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# 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?)

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## Sensors and sensor networks

- Clear requirement for further fundamental sensor development, e.g. but not exclusively $NO_x$, PM (but these are current needs).
- How to characterise sensors / sensor nodes: laboratory *vs.* field

- How good are sensors under realistic conditions?
  $\Rightarrow$ 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 $\Rightarrow$ $\Rightarrow$ $\Rightarrow$ indicative

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## 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