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

COST Action TD1105

Final Meeting at PRAGUE (CZ), 5-7 October 2016

New Sensing Technologies for Air Quality Monitoring

Action Start date: 01/07/2012 - Action End date: 15/11/2016 - EXTENSION: 15/11/2016

AIR QUALITY ISSUES IN HUNGARY

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Scientific context and objectives in the Action

Scientific context / challenges

- official background monitoring in Hungary
- chemical weather forecast (Budapest) and regulatory dispersion modeling for Hungary
- air quality legislation

Brief reminder of MoU objectives

- contribution to the SIG4 objectives
  - expert comments for the revision of the Air Quality Directive
- contribution to the WG3.1 and 3.2 objectives
  - environmental measurements at laboratory and in field air quality stations
  - air quality modeling and chemical weather forecasting

Current research activities 1- Different tools in the air quality control

- **Air quality monitoring**
  - –Accurate, continuous in time, but point-wise in space
  - –Measuring strategy attempts to improve spatial coverage: station sites should represent larger areas
  - –expensive
- **Air quality modelling**
  - –less accurate, but provide spatial distributions of pollutant concentrations
  - –different spatial scales required different approximations
  - –cheaper
- **combination the advantages of the two different tools**
  - **–Provide more complete assessment of the air quality situation**

Current research activities 2 – monitoring (proposals)

- Under the Grant of the Hungarian Operative Programme for 2014-2020: new PM2.5, CO, SOx, NOx monitors to the main background station K-puszta – standard, high-cost sensors to an official station
- Under the Hungarian Grant of Research and Innovation: develoing new low-cost sensors for urban air pollution monitoring – the HMS is an advisory partner
- Development of a modell-system for analysing the sources of the background PM level in Hungary - monitoring the transboundary sources to the Hungarian particulate matter pollution level in cooperation with other organisations (e.g. Institute for Transport, Institute for Agriculture)

Current research activities 3 – modelling (proposals)

- Development of a modell-system for analysing the sources of the background PM level in Hungary
- Development of chemical weather forecast models for Budapest and 11 major cities in Hungary:

A WEB based chemical weather forecasting and information system

- **Chemical transport model – CHIMERE**
- **Emission data**
  - point and area sources, agriculture
  - domestic heating
  - industrial processes
  - traffic
- **Meteorological data**
  - WRF (AROME) numerical weather prediction models
- **Visualization – HAWK (Hungarian Advanced WorKstation)**

Research Facilities

- Numerical weather prediction models (ECMWF, ALADIN, WRF, AROME)
- Chemical transport models (CHIMERE)
- Regulatory models (AERMOD, EDMS)
- Dispersion models (FLEXTRA, FLEXPART)
- Standard mobile monitoring equipment for expeditional measurements
- Analitical laboratory with equipment of standard backgound sampling and analysing

Suggested R&I Needs for future research

- Participation in a case-study in urban environment
  - Validation by models
  - Validation by mobile standard monitoring equipments
  - Participating with newly developed low-cost sensors