



COST

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

COST Action TD1105

**Special Session: Environmental Case Studies from
Mediterranean, Central and Eastern Europe**

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Hungarian Meteorological Service / Hungary



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 **Gender Balance Committee** objectives
- 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



Issues on harmonisation of environmental measurements and modeling in Hungary

All air quality directives are adapted to the Hungarian legislation, e.g.:

- **306/2010 governmental decree on the protection of air quality**
- **4/2011 decree of the Ministry of Rural Development on the limit values of air concentrations and emitted values**
- **69/2008 decree of the Local Authority of Budapest on the smog alarm**
- **96/2009 decree of the Parliament on the National Environmental Protection Program 2009-2014**



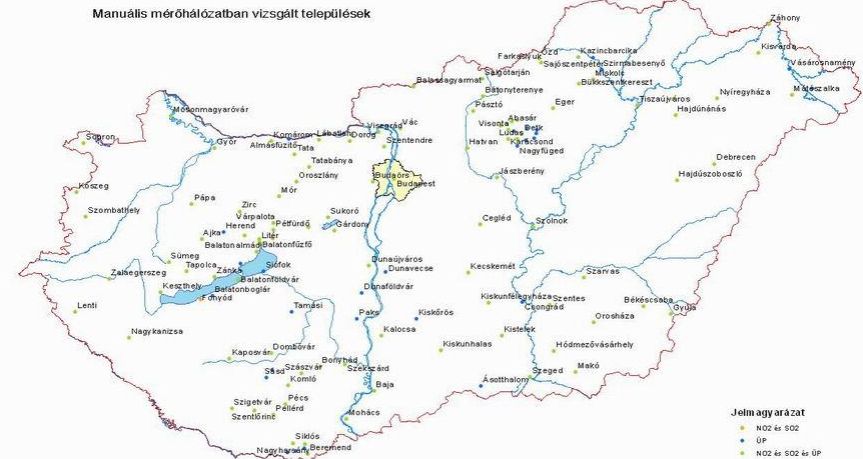
Governmental authorities work on monitoring and controlling of air quality issues

- **Ministry for Rural Development**
in 2010, the former **Ministry for Environment Protection** was dissolved
- **background institutes of the ministry**
 - **Regional Inspectorates for the protection of air, water and nature**
 - operate the urban monitoring network and work with regulatory issues
 - **Hungarian Meteorological Service**
 - operates the background monitoring network
 - manages the monitored data of the inspectorates
 - makes chemical weather forecasts

National monitoring networks in Hungary



Automata urban monitoring stations



manual sampling stations



background monitoring and sampling stations

Monitoring program of K-pusztá

- Trace gases:

- **SO₂, NO₂, O₃, NH₃, HNO₃**

- Aerosols:

- **sulfate, nitrate, ammonium, sodium, potassium,**
- **calcium, magnesium, heavy metals , PM₁₀, PM_{2.5}**

- Inorganic compounds in precipitation:

- **pH, conductivity, sulfate, nitrate, ammonium, chloride, sodium magnesium, calcium, potassium, heavy metals**

- K-pusztá is our reference station, member of the EMEP and WMO/GAW network.
- The monitoring program of this station is the widest.





Problems in the Hungarian networks

Serious financial problems – reduction in the budget of governmental institutions

- old equipments, lack of service, difficulties in maintaining
- not any investments into new technologies
- decline in human resources

Few, slow and bureaucratic tenders, aids or supports

there are tasks with no sources on this field

Few and sporadic researches and new technologies

every institution or scientific group tries to find the financial support



Air Quality Modeling in Hungary

Hungarian Meteorological Service

- **Long-range transport modeling (EMEP model)**
- **Regulatory modeling (AERMOD, EDMS)**
- **Lagrangian particle dispersion modeling (decision support in case of accidents) (FLEXTRA and FLEXPART)**
- **Chemical weather forecasting for Budapest (CHIMERE + WRF or AROME)**

University research groups

Small business groups



Air Quality Modeling in Hungary

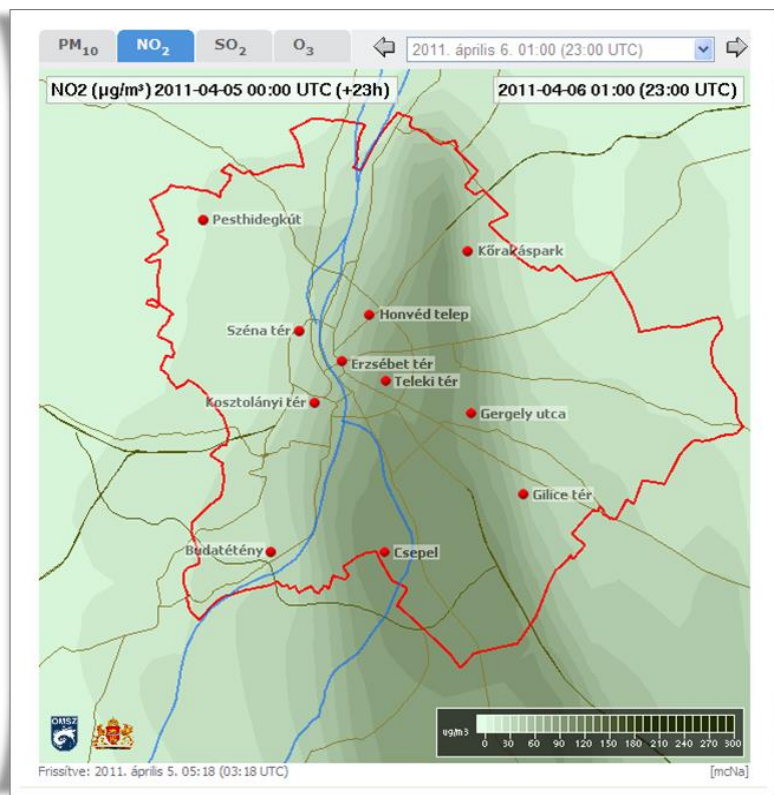
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Chemical weather forecast for Budapest maps and diagrams





Harmonisation issues in Hungary

- **Hungarian legislation regulates only the measurements – however it is made by the government with very limited financial sources**
- **Modeling is mentioned in legislation only in case of environmental regulation of individual sources or accidental releases**
- **Modeling groups are small and separated with limited sources also**
- **At our institute, there is a stop for enlarging the scientific teams (only one scientist works with models)**
- **There are no official efforts so far for using models in air quality issues**

Future plans

- Air pollution monitoring :
 - We measure background air pollution in Hungary under the regulations of EMEP and GAW
 - Most of the pollutants concentration are detected in the laboratory
 - K-pusztta: EMEP – „1 level monitoring station”, GAW – „regional station”
 - Plan to improve the measurements of PM₁₀/PM_{2.5}
 - new PM2.5 sample collector (only daily samples)
- Air quality modeling:
 - human resource shortage
 - 1 staff in this field
 - PhD students should involved into the research activity
 - Short-term Research Plan:
 - Predictability analysis of PM₁₀ concentration
 - Determine the most important meteorological parameters affecting PM₁₀ concentration
 - Improve the chemical weather forecast system



Thank you for your attention!