

Air Quality Monitoring Technologies for Urban Areas

AirMonTech 2010 -2013

Thomas A.J. Kuhlbusch



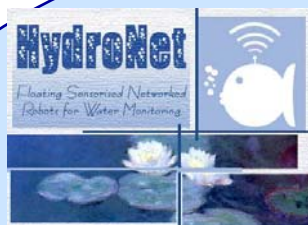


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Community research

Monitoring technologies

Example of ongoing EU research



PROTOOL



Sustainable Management of Water Resources
by Automated Real-Time Monitoring



- **Marine/coastal monitoring**
 - Floating sensorised robots
 - PP automated devices
- **Soil contamination mapping**
 - Geophysical sensors (geoelectric, seismic, magnetic, SPI, GPR/EMI)
 - Geochemical techniques
 - Biosensors
- **Water monitoring**
 - Water pipelines and buried infrastructures
 - Aquifer monitoring
 - Drinking water quality
- **Air monitoring**
 - Automated analysers for monitoring urban air





Technologies for automated monitoring of air pollution in cities

(Call FP7-ENV-2010, topic ENV.2010.3.1.7.1)(1/2)

- To **review the state-of the-art** and assess opportunities and limitations of **recent and new** generations of in-situ technologies for urban air pollution monitoring
- Particular focus on **automatic analysers for the continuous routine monitoring** of harmful substances, especially particulate matters and emerging pollutants, also using proxy indicators
- Equipment evaluation and selection, operation, maintenance and calibration, data quality, protocols, and processing ... as well as aspects of cost efficiency and equivalence to reference monitoring methods.
- Delivery of a **technological research roadmap** and **consolidated recommendations** for the development or implementation of Community environmental legislation
- Involvement of the **researchers** and **technology providers** together with the **stakeholders involved in routine monitoring** of urban air pollution
- Strong links to relevant national and international programmes and networks



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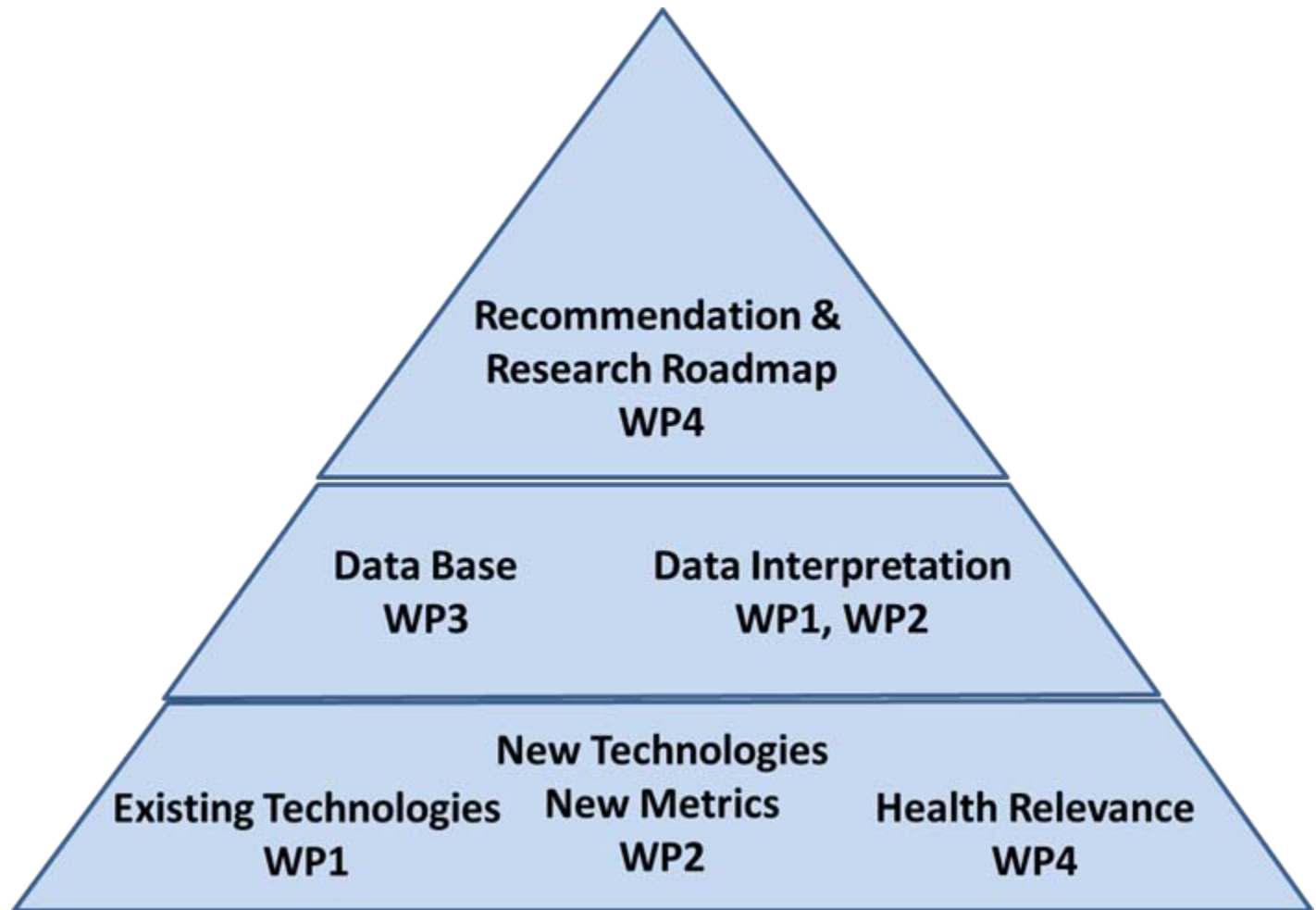
Community research

Expected impact

- Harmonised air pollution monitoring in Europe
- Improved implementation of EU environmental policies and strategies on ambient air quality and cleaner air for Europe
- Better coordination of relevant national research activities



AirMonTech Structure



Topic 1 (Recent technologies)

- “Recent technologies for air pollution monitoring” will highlight opportunities and limitations of current monitoring techniques used for urban air quality assessment and provide guidance on the choice, operation, calibration and quality assurance of air quality monitors.

Topic 2 (New Technologies & New Metrics)

- “New generation technologies for air pollution monitoring” will assess the possibilities and limitations of alternative and emerging monitoring technologies for the use in routine, automated urban air monitoring of
 - (a) the air pollutants covered by WP1,
 - (b) alternative measures and proxies for characteristics of ambient particulate pollution that are responsible for adverse health effects
 - (c) pollutants of the 4th daughter directive (Directive 2004/107/EC)
 - (d) volatile organic compounds being health relevant or acting as ozone precursors.

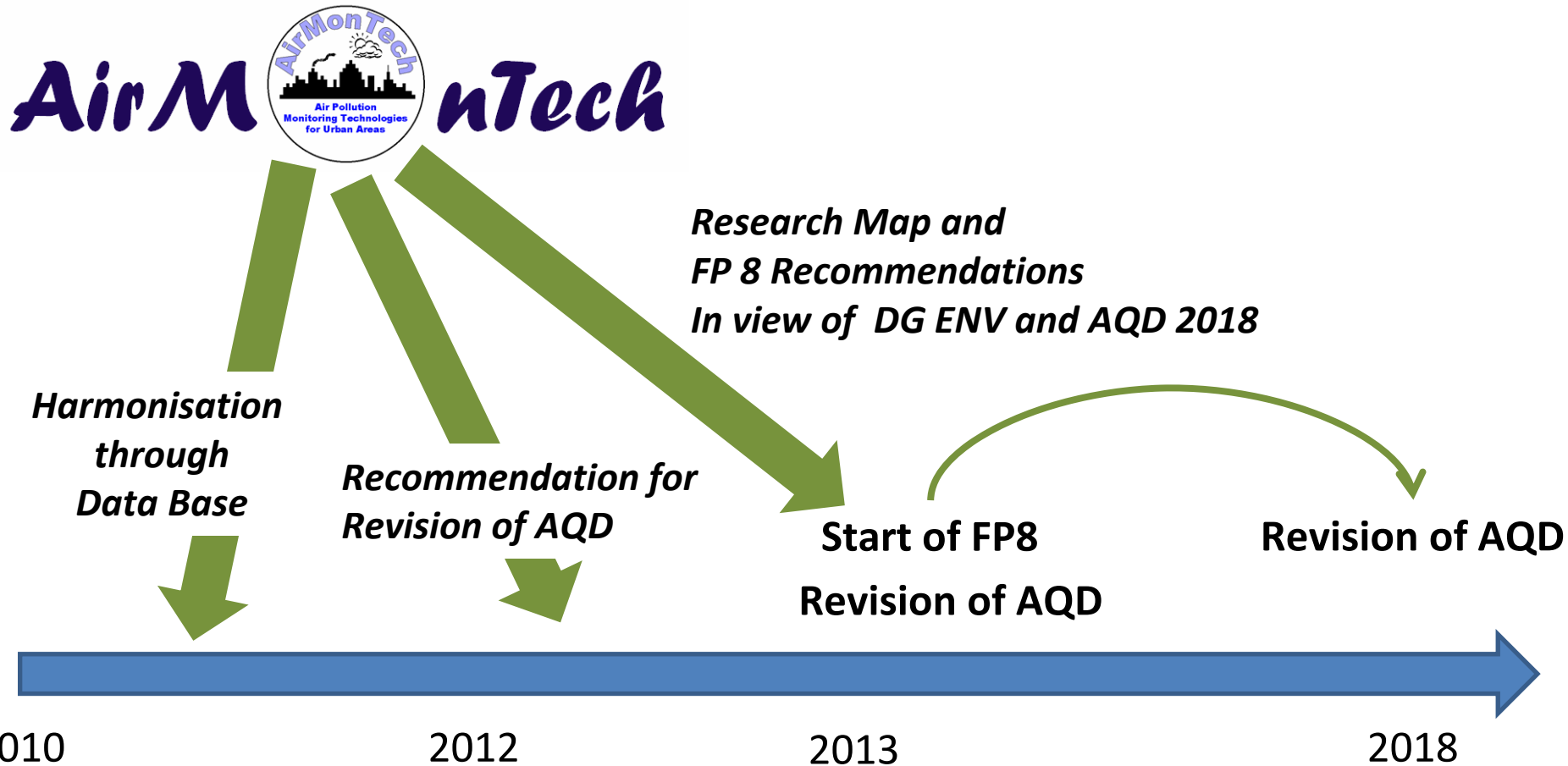
Topic 3 (Data Base)

- “Databases on air monitoring technologies and performances” serves to the project by providing a vivid platform of information on air quality monitoring for the data collection and management.
- As a multitude of information will be collected being linked to each other in multiple directions only specifically designed databases will allow the project members and stakeholder groups to make optimal use of the data.

Topic 4 (Research Roadmap)

- The production of “recommendations and research roadmap” will be a systematic process. The recommendations will be determined primarily by the following criteria and sources of information:
 - (1) Knowledge of health effects of specific pollutants
 - (2) Knowledge of atmospheric chemistry, as relevant to choosing proxy or precursor species not covered by health effects studies
 - (3) Capabilities of available or recently-developed technologies, and their indicative purchase and operation costs
 - (4) Consideration of new monitoring strategies
 - (5) Experience gained in operating real monitoring networks
 - (6) Existing EU environmental strategies
 - (7) Continuity with existing legislation and practice.

Time line of policy relevant aims



AirMonTech



**Harmonisation
through
Data Base**

**Recommendation for
Revision of AQD**

**Research Map
FP 8 Recommendations
In view of DG ENV and AQD 2018**

**Start of FP8
Revision of AQD**

Revision of AQD

- Recommendations policy relevant
- Achievable
- Usable style for all stakeholder

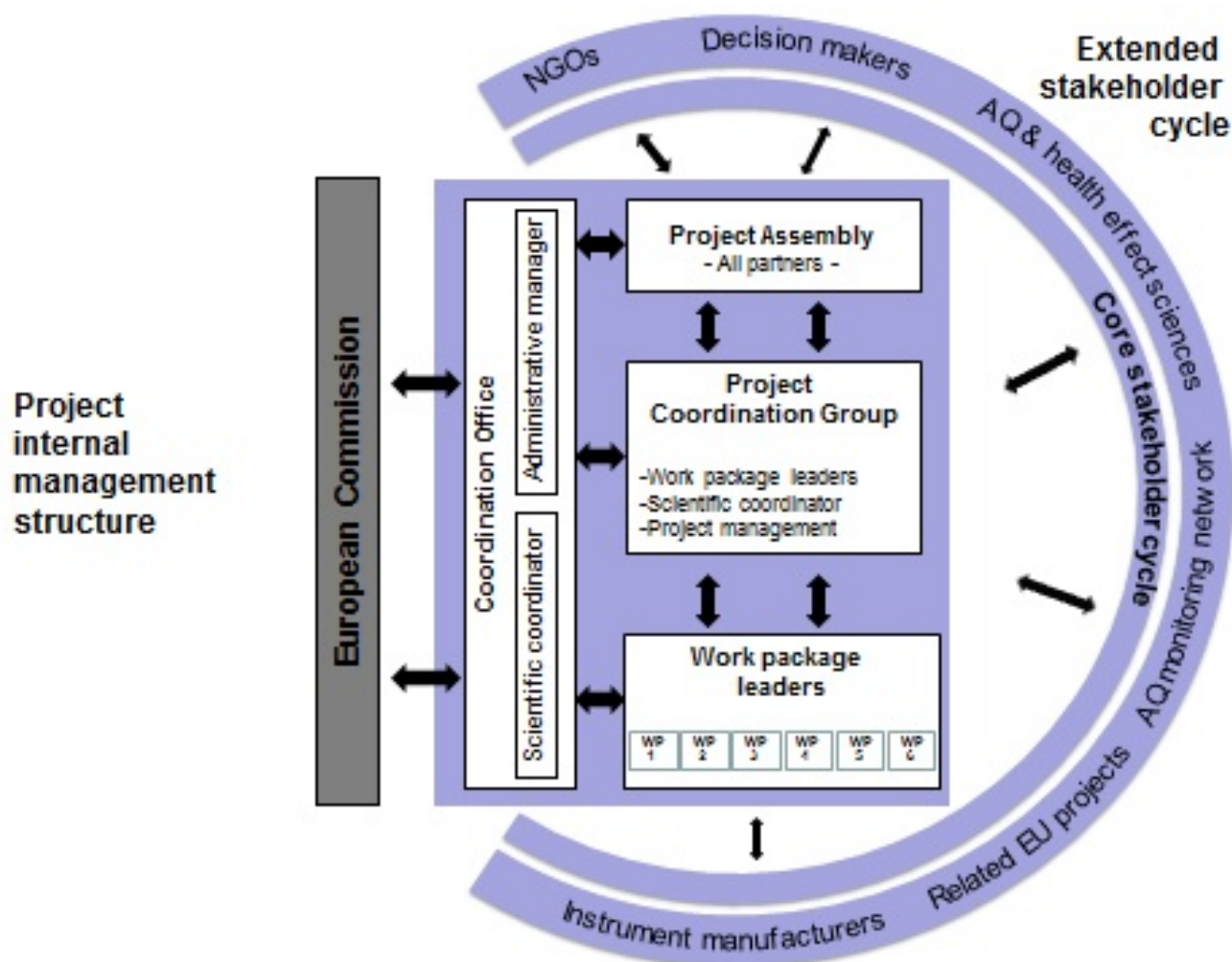
2010

2012

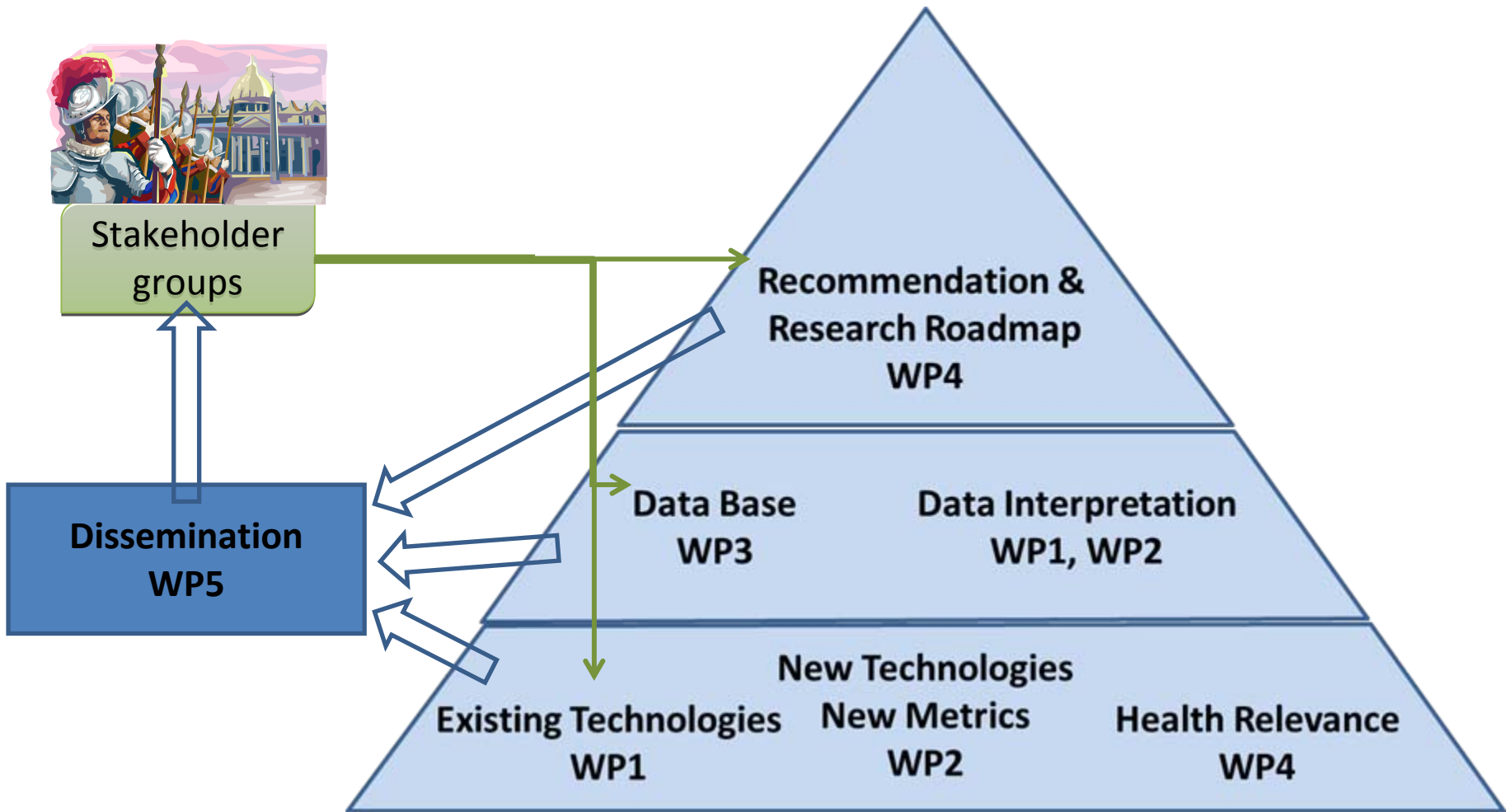
2013

2018

Dissemination scheme



AirMonTech Structure



Call for data and Information

- Which instruments / techniques to include!
- Calibration and evaluation data
- Comparison measurement data
- Standard operation procedures and maintenance information

From Stakeholders:

- **Network people**
- **Developers**
- **Scientists**
- **Manufacturers**

Workshop 1

About AirMonTech Air Quality Monitoring Technologies for Urban Areas

The new FP7 EU project AirMonTech compiles information to harmonize current air pollution monitoring techniques and to advise on future monitoring technologies and strategy. AirMonTech will gather information on instrument performance, test results, equivalence demonstrations and procedures for operation, maintenance and calibration, and process them into specifically designed databases.

Particular emphasis will be placed on methods for real-time monitoring of particles and particle-related proxy variables. A roadmap for future urban air quality monitoring including recommendations on existing and new monitoring technologies will be developed and discussed with stakeholders.

Opportunities and limitations for the improvement and harmonization of monitoring activities in EU Member States will be evaluated in an interactive dissemination process involving all relevant stakeholder groups.

www.AirMonTech.eu



The AirMonTech workshop is held jointly with the annual Air Quality Conference of the Automation and Analytical Management Group of the Royal Society of Chemistry.

Registration at:
www.aamg-rsc.org

For further details on AirMonTech see
www.AirMonTech.eu

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Announcement Workshop and Conference on Current and Future Air Quality Monitoring December 14/15, 2010

*At The Royal Society of Chemistry,
Burlington House, Piccadilly, London*



AirMonTech is a European research project co-financed by the European Commission in the 7th Framework Programme

Workshop 1

Background and goals

The workshop "Current and Future Air Quality Monitoring" is the start of several workshops within the framework of the new EU FP7 project AirMonTech. Your active participation in this process is highly welcomed and needed to improve current air quality measurements of gaseous and particulate pollutants as well as to define a roadmap of research and development needed for the next 20 years.

We aim at selected presentations and discussions with all stakeholders involved in this topic, e.g. Air Quality Monitoring Networks, NGOs, politicians, EU commission, measurement device producers, and researchers.

Day 1 (14.12.2010, 09:00-18:00)

"Measurement technologies for regulated compounds"

Registration of participants

- Welcome address - *P. Quincey, NPL, UK*
- EC Expectations to AirMonTech - *M. Schouppe, EC, EU*
- Introduction to AirMonTech - *T. Kuhlbusch, IUTA, D*
- Outline WP1: Recent technologies for air pollution monitoring - *Ch. Hueglin, EMPA, CH*

Coffee Break (Exhibitors, Posters)

Existing technologies for regulated metrics

- Principles of type approval for monitoring systems - *P. Woods, NPL, UK*
- Equivalence tests: Principles and the PM issue - *U. Pfeffer, LANUV, D*
- Ongoing QA/QC for PM monitoring: Requirements from AMS group of TC264/WG15 - *T. Hafkenscheid, RIVM, NL*

Lunch (Exhibitors, Posters)

- Developments and recommendations for EC/OC monitoring - *J.P. Putaud, JRC, EU*

- NO₂-measurements with different converters: Molybdenum converters vs. specific NO₂ measurements - *R. Gehrig, EMPA, CH*
- Analytical characteristics for benzene and VOC automatic measuring system : results from laboratory and field campaigns - *N. Lacoge, ENSM-DOUA, F*
- Discussion on existing technologies for regulated metrics

Coffee Break (Exhibitors, Posters)

Data collection and dissemination within AirMonTech

- The AirMonTech data base, an important step towards the harmonisation of European monitoring - *A. Borowiak, JRC, EU*
- Discussion: expectations on and needs for the data-base

New technologies for regulated metrics

- Sensors for monitoring regulated compounds - *M. Gerboles, JRC, EU*
- Mobile multi-species trace vapour sensors for localised pollution monitoring and mapping - *M. Richards, IC, UK*
- Performance of laserspectroscopic technologies for determination of regulated compounds - *Ch. Hueglin, EMPA CH*
- Discussion on new technologies for regulated metrics

Day 2 (15.12.2010, 09:00 – 17:00)

"New metrics, technologies and strategies"

- Outline WP 2: The future of AQ monitoring - *U. Quass, IUTA, D*

New technologies and alternative metrics

- Knowns, unknowns and needs for health relevant new: metrics - *K. Katsouyanni, NKUA, Gr*
- ROS - A potentially health relevant alternative metric - *F. Kelly, KCL, UK*
- Particle surface area measurements – Are current techniques applicable? - *T. Kuhlbusch, IUTA, D*

Coffee Break (Exhibitors, Posters)

- A new potentiometric method for automated detection of Bioaerosols - *D. Sarantidis, UCL, UK*
- Instrumentation based on wet sampling techniques with on-line detection - *R. Otjes, ECN, NL*
- Source contribution - an alternative metric? - *X. Querol, CSIC, E*
- Discussion on new technologies and alternative metrics

Lunch (Exhibitors, Posters)

New monitoring strategies – Approaches

- Application and limitations of satellite remote sensing technology for estimating air emissions and concentrations of pollution at ground level in low-latitude climates - *M.A. Fagbeja, UWE, UK*
- The German Ultrafine Aerosol Network - Experience with routine particle size distribution measurement - *W. Birmili, IfT, D*
- UK particle number measurement network - *P. Quincey, NPL, UK*
- Personal monitoring of exposure to Black carbon - *E. Dons, VITO, B*
- Development of a new measuring bike for mapping dust levels in urban environments: The Aeroflex bike - *M. Van Poppel, VITO, B*
- Discussion on metrics and monitoring strategies

Coffee Break (Exhibitors, Posters)

What is needed to evaluate/establish new technologies and new metrics?

- Future urban AQ monitoring in Europe - *E. de Saeger, EC, EU*
- How can background measurements be linked with urban air quality monitoring - *K. Tørseth, NILU, N*
- Wrap-up and outlook - *T. Kuhlbusch, IUTA, D*

End of workshop