



# COST

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

COST Action TD1105

**WGs and MC Meeting at Rome, 4-6 December 2012**

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

Year: 2012-2013 (*Starting Action*)



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# Scientific context and objectives in the Action

- **Scientific Context & Challenges:**
  - Dynamic adaptation of sensors and sensor modules
  - Low power design & energy efficiency
  - Middleware & tools for embedded systems interoperability and seamless integration
  - Wireless Sensor Network planning, management & re-configuration mechanisms
  - Utilization and mapping of standards under severe resource constraints
- **Matching Action:**
  - **Objectives:**
    - Protocols for development of wireless sensor network for AQC
    - Report on integrated intelligence of AQC gas sensors and distributed computing
  - **Deliverables:**
    - Recommendations for AQC wireless sensor networks management
    - Guidelines for an open framework on new sensing wireless technologies for AQC

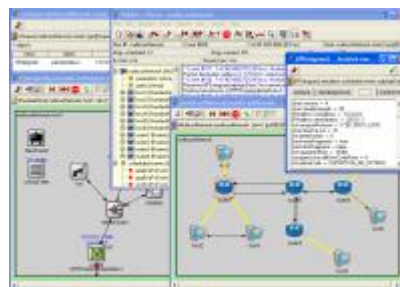
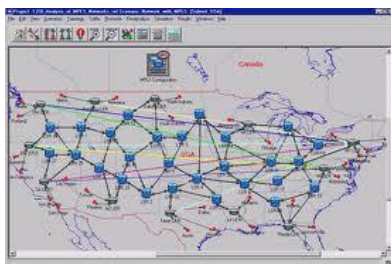


# Current Research Activities

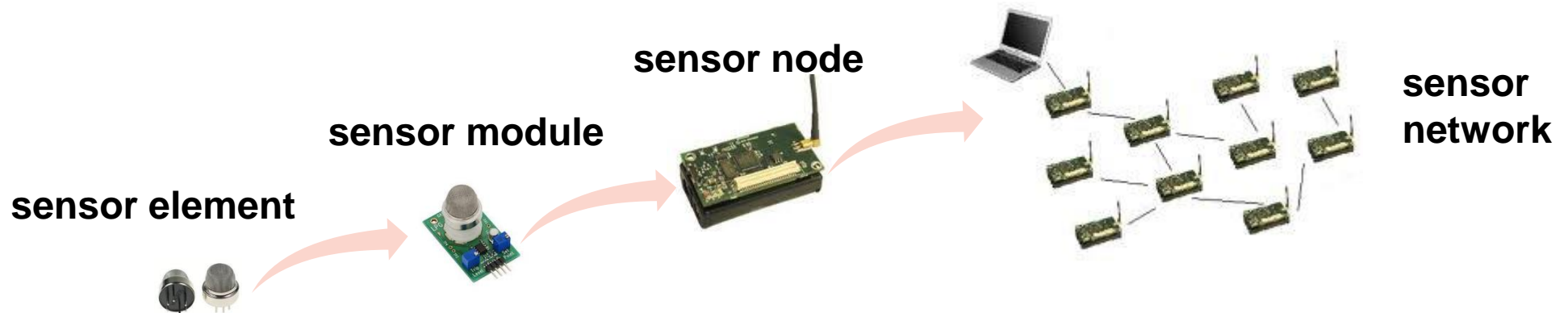
- Planning tools for the placement of the nodes and implementation of localization techniques.
- Sensor & Network management and re-configuration mechanisms
  - Active control for reliability and energy efficiency
- Middleware architectures for composability, interoperability and seamless / plug & play integration of multiple sensor modules, nodes and networks
  - Resource aware composition support
  - Multiple composition mechanisms support
- Utilization and mapping of standards in resource constrained distributed embedded systems and application development frameworks
  - IEEE 1451.x, CoAP, OGC/SWE

# Research Facilities

- Laboratory equipment to support embedded hardware and firmware development
  - Hardware schematic and PCB design entry stations, oscilloscopes, digital logic analyzers and various microcontroller development systems and tools
- Infrastructure for research and development of hybrid wired/wireless industrial networks and low power wireless sensor networks
  - Protocol simulators, protocol analyzers and software development tools for heterogeneous WSN nodes and systems.



# Suggested Priorities



- Study of sensor elements active control techniques on all levels:
  - Sensor module → enhanced electronics (i.e. for self-monitoring)
  - Sensor node → improved selectivity and stability via information correlation
  - Sensor network → enhanced reliability, auto-configuration/calibration



# Suggested Priorities

- Devise a model-based, high-level framework for rapid AQC system development utilizing smart sensors and networks of sensors
  - Top-down, system level models for multi-sensor integration and data processing
    - Distributed algorithms and techniques to improve data accuracy, system robustness and efficiency
    - Adoption and mapping of standards to describe sensor properties and observation values
  - Bottom-up integration of heterogeneous technology blocks
    - New low-power and energy efficient realizations
    - New networking technologies and protocols