

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

COST Action TD1105

**WGs & MC Meeting at SOFIA (BG), 16-18 December 2015**

***New Sensing Technologies for Indoor Air Quality Monitoring: Trends and Challenges***

Action Start date: 01/07/2012 - Action End date: 30/04/2016 - Year 4: 1 July 2015 - 30 April 2016

## Updating on Report

# ***Innovation on Environmental Sensor Technologies***



Agenzia nazionale per le nuove tecnologie,  
l'energia e lo sviluppo economico sostenibile

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 **cost**  
EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY





# Why a position paper on...?

- To assess the key factors in sensor technology and the relative state of the art in an effective and exhaustive way
- To depict, as excellent and comprehensive community, a collective Vision in order to define a Roadmap of suggested implementation actions
- To map existing approaches and methodologies in Innovation in AQC and propose new ones
- To map the strengths and weaknesses factors of the European Technology in sensors for ACQ
- Increase and share in the community the awareness of the existing and developing methodologies to produce innovation in the Action topics.



# Expected Deliverables from Focus Group on Innovation...

- A Report on European Innovation Sensor Technologies for Air Quality Monitoring
- A Scoping Paper with Vision, Roadmap and suggested EU actions to boost the “societal innovation stars” (research, education, industries, institutions, citizens) in AQC
- A publishable review article on innovation in sensor technology for AQC
- A smart specialisation platform for sensor technology in AQC: rationale and synergies with existing initiatives

# Table of Contents -1-

## Management Summary (Executive Summary) - 1 page

REFERENCE POINT: Penza



## Vision and Strategic Goals - 1 page

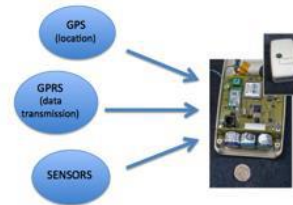
REFERENCE POINT: Penza

OTHER CONTRIBUTORS: Schuetze, Karatzas, Borrego, Hertel, Chowdhury, von Sicard, Hueglin

## Typical Applications - 3 pages

REFERENCE POINT: Schuetze

OTHER CONTRIBUTORS: Karatzas, Hueglin.....



## Political, Economic and Technical Framework - 2 pages

European Regulation and EU Ambient Air Directive

Other Definitions ???

REFERENCE POINT: Borrego

OTHER CONTRIBUTORS: Hertel, Karatzas, Hans-Guido Muecke (WHO-CC), Romano



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## Key Challenges/Solutions and Priorities in the Different Segments of the AQC “Technology Value Chain”:

### Indoor Air Quality Applications - 5-10 pages

REFERENCE POINT: Schuetze

OTHER CONTRIBUTORS: Kock, von Sicard, Noren, .....

Research, Development and Innovation

Companies

Academy

Agency

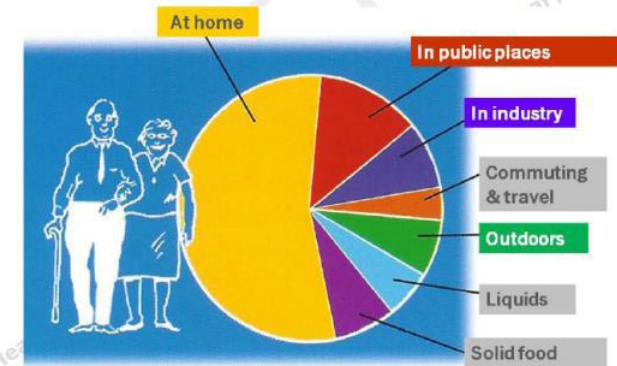
### Outdoor Air Quality Applications - 5-10 pages

REFERENCE POINT: Hertel

OTHER CONTRIBUTORS: Kostas Karatzas, Carlos Borrego, Nuria Castell, Thomas Schneider, Jan Theunis, Christoph Heuglin, Maria Bech Poulsen

GUIDELINES FOR HEALTH-BASED VENTILATION IN EUROPE - HEALTHVEN

## Indoor air is significant contributor to life-time exposures



<http://www.healthvent.byg.dtu.dk/>



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**Key Challenges/Solutions and Priorities in the Different Segments of the AQC “Technology Value Chain”:**

## IOT in Air Quality Applications

Reference Point: Martimort

## Standards and Protocols - 2 pages (APPENDIX B)

Research, Development and Innovation

Companies

Academy

REFERENCE POINT: Ingrid Bryntse?, Oliver Martimort?(*to be asked/confirmed*)

OTHER CONTRIBUTORS: *WG4 members/sub-leaders: Saffield, Moser, Romain, (tbc)*

## Educational Needs - 2 pages

REFERENCE POINT: Romano

OTHER CONTRIBUTORS: Karatzas, Hertel, Schuetze, Borrego

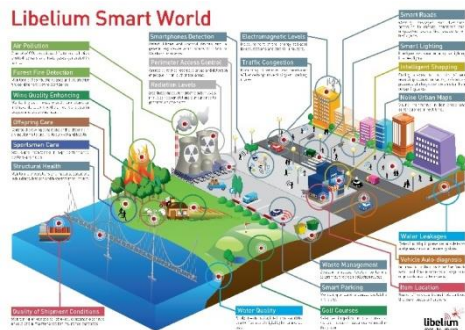
- for company
- for agency
- for research

## Societal Needs - 2 pages

REFERENCE POINT: Karatzas

OTHER CONTRIBUTORS: .....

- Indoor Air Quality Applications
- Outdoor Air Quality Applications



<b>Wearables</b> <ul style="list-style-type: none"> <li>Entertainment</li> <li>Fitness</li> <li>Smart watch</li> <li>Location and tracking</li> </ul>	<b>Building &amp; Home Automation</b> <ul style="list-style-type: none"> <li>Access control</li> <li>Light &amp; temp control</li> <li>Energy optimization</li> <li>Predictive maintenance</li> <li>Connected appliances</li> </ul>	<b>Smart Cities</b> <ul style="list-style-type: none"> <li>Residential E-meters</li> <li>Smart street lights</li> <li>Pipeline leak detection</li> <li>Traffic control</li> <li>Surveillance cameras</li> <li>Centralized and integrated system control</li> </ul>
<b>Smart Manufacturing</b> <ul style="list-style-type: none"> <li>Flow optimization</li> <li>Asset tracking</li> <li>Employee safety</li> <li>Predictive maintenance</li> <li>Firmware updates</li> </ul>	<b>Health Care</b> <ul style="list-style-type: none"> <li>Remote monitoring</li> <li>Ambulance telemetry</li> <li>Drugs tracking</li> <li>Hospital asset tracking</li> <li>Access control</li> <li>Predictive maintenance</li> </ul>	<b>Automotive</b> <ul style="list-style-type: none"> <li>Infotainment</li> <li>Wire replacement</li> <li>Telemetry</li> <li>Predictive maintenance</li> <li>C2C and C2I</li> </ul>

**IAQ SOLUTIONS PROTOCOL**

It supplies standards for acceptable indoor air quality.

Pollutant	EU reference value	Exposure estimate (%)	WHO AQG	Exposure estimate (%)
SO <sub>2</sub>	Day (12h)	0-3-2.3	Day (2h)	68-85
NO <sub>2</sub>	Year (40)	7-19	Year (40)	7-19
PM <sub>10</sub>	Day (50)	18-40	Year (20)	80-90
PM <sub>2.5</sub>	Year (35.3)	< 1	Year (10.5)	< 1
CO	8-hour (10)	0-2	8-hour (100)	0-2
O <sub>3</sub>	8-hour (120)	16-50	8-hour (100)	> 95

Colour coding of exposure estimates, fraction of urban population exposed to concentrations above the reference level:

- < 10 %
- 10-50 %
- 50-90 %
- > 90 %

**Needs Assessment**





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## **Main Industrial Needs and Related R&D Challenges and Skills**

REFERENCE POINT: Martimort

OTHER CONTRIBUTORS: .....

## **Main Research Needs in Terms of Instruments, Infrastructures, Regulations**

REFERENCE POINT: .....

OTHER CONTRIBUTORS: .....

## **Best European and World Practices in Sensor Technology (1 page/COST Country)**

*Country Analysis (COST Parties joined to EuNetAir)*

REFERENCE POINT: Penza

OTHER CONTRIBUTORS: MC/WG Leaders - *ITALY FORMAT by Penza*

## **Representation, Communication etc.**

REFERENCE POINT: Karatzas

OTHER CONTRIBUTORS: .....Martimort

## **Conclusions / Recommendations - 1 page**

ALL

## **Relevant Bibliography (more recent, no limit)**

REFERENCE POINT: Chowdhury

OTHER CONTRIBUTORS: ALL

## TIMELINE OF REPORT

**DECEMBER 2015 - FOCUS GROUP MEETING ON INNOVATION (SCOPING PAPER, VISION, ROADMAP, IMPLEMENTATION ACTION).**

**Sofia (Bulgaria)**

**MARCH 2016 - FIRST VERSION OF THE REPORT, WIEN, Austria (tbc)**

**MAY-JUNE 2016 - FINAL VERSION Report at BRUXELLES (tbc)**



**THANKS  
FOR  
YOUR KIND  
ATTENTION!**

**First Focus Group meeting in Siemens - Munich.**



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