AirMonTech
An FP7 action in support to EU policies in the fields of Air Quality and Innovation

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AirMonTech Workshop
Current and Future Urban Air Quality Monitoring

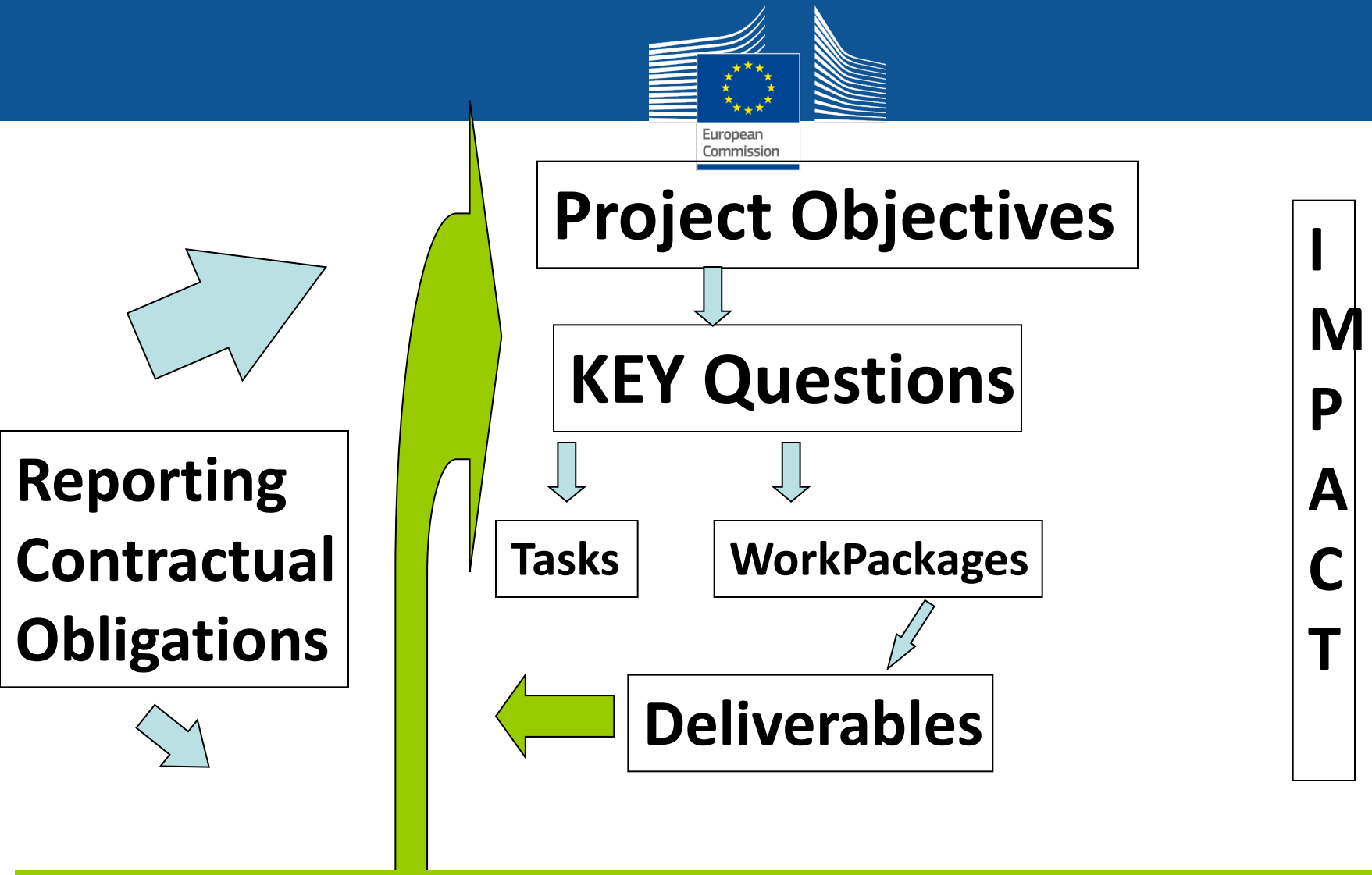
Brussels, 16 May 2012

FP7 Call 2010 for technologies and automated monitoring of air pollution in cities

- 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
- **Links** to relevant national and international **programmes and networks**

AirMonTech in a nutshell

- **Review of recent technologies (approval tests, standard operating procedures, equivallence testing)**
- **Review of novel promising technologies for automated monitoring or regulated and non-regulated air pollutants**
- **Data base of air pollution monitoring technologies**
- **Recommendations and roadmaps for:**
  - Enhanced harmonisation and standardisation
  - Adoption of new monitoring devices/strategies
  - New health relevant metrics
  - Research agenda for improved air quality monitoring
- **Leading to:**
  - More harmonised air pollution monitoring in Europe
  - Contribution to the review of the EU air policy package
  - Contribution to eco-innovation



Report should not focus only on the deliverables and WP activities but should clearly demonstrate how the project objectives and the expected impact are achieved---- VERY Important in a final report (AIRMONTECH)

Review of recent technologies (WP1)

- **Collection of information on instrument performance, equivalence demonstrations, operating procedures, maintenance and calibration.**
  - 200+ documents provided by the European measurements community from 16 different countries
  - Standard operating procedures (SOP), eEquivalence test reports, type approval reports, technical specification sheets, application examples and inter-comparison results
- **AirMonTech guidance documents on Metric Basic Information (MBI), Metric Measurement Technology Overviews (MMTO) and Metric Measurement Technology Information (MMTI):**
  - For Carbon monoxide, ozone, sulphur dioxide, nitrogen oxides, benzene and particulate matter
- **AirMonTech model SOPs for atmospheric pollutant measurements:**
  - Carbon monoxide, ozone, sulphur dioxide, nitrogen oxides, benzene and particu-late matter.

Review of novel promising technologies (WP2)

- **Comprehensive AirMonTech survey of scientific and instrument manufacturers' literature**
  - "Novel": not yet regularly applied in urban air monitoring networks, not yet available commercially or just in initial stage of being marketed
- **For regulated pollutants: four main directions of development:**
  - Compact monitoring stations
  - Enhanced detection features by new physical principles
  - Simultaneous monitoring of several trace gases
  - Microsensors
- **For non-regulated and emerging pollutants and proxy indicators:**
  - Multitude of instruments and methods were identified as available
  - Considerable research efforts in instrument development are still needed to realise automated monitoring

AirMonTech Database of AQ monitoring (WP3)

AirMonTech database online since 16 November 2012:
a unique online European catalogue for network operators, instrument manufacturers and researchers

http://db-airmontech.jrc.ec.europa.eu/

Recommendations (WP4)

MONITORING STRATEGIES - 9 recommendations including:

- To encourage the uptake of new technologies, to respond to changing priorities, and to reduce “monitoring inertia”.

MONITORING TECHNOLOGIES – 11 recommendations including:

- Priority parameters for extended field trials are real time methods for ammonia, black carbon, particle surface area concentration, particle number concentration, organic carbon, and particle composition, specifically simplified Aerosol Mass Spectrometry for organic speciation, and automated analysers for elemental components.

Research Roadmap (WP4)

Seven proposed “project” topics:

- Instrumentation: new improved monitoring technologies and procedures for alternative metrics, relating to health and source monitoring.
- Modelling: leading to the development of a modelling and air quality data integration tool, including for alternative metrics.
- Health effects: leading to robust methods to achieve (Europe-wide) routine health effect monitoring and health impact assessments.
- Implementation: strategies of new AQ network designs, including for new metrics.
- Data integration: methods for optimised use of all monitoring data and modelling outputs to enable routine health, source, abatement and compliance assessment.
- Population exposure: methods to improve the estimation of population exposure from ambient concentrations and other data.
- Full integration: implemented integration of air quality and health monitoring at selected cities.

Science policy brief (WP5)

RECOMMENDATIONS to policy makers

- Extension and intensification of the current population-exposure-related approach of regulating air quality
- Extension and strengthening the use of further air quality parameters (including soot in particulate matter)
- Linking research and routine air quality measurements and effect studies
- Set-up of urban environment and health research platforms for long-term assessments of the investments made for AQ improvement with regard to life expectancy and quality of life

CHALLENGE AHEAD of importance for policy making

- a coherent approach linking the advantages of mobile and small fixed site monitoring, remote sensing and modelling with that of fixed measurement sites

AirMonTech: not just an excellent one-off support to the AQ community in Europe

- **Importance to sustain interactive communication with core stakeholders**
  - Synergies with the EuNetAir COST Action (European Network on New Sensing Technologies for Air-Pollution Control and Environmental Sustainability)
- **Enlarge the AirMonTech community to outreach the EU28 and beyond**
- **AirMonTech database**
  - Keep promoting its “fame and reputation” by relevant stakeholders groups
  - Keep the database alive, empower a wider community of users to expand it
  - Strengthen its functionalities (search, quality check, links to social networks)
  - Guarantee long-term maintenance
- **Foreground exploitation to strengthen innovation and consolidate expertise and market opportunities for AQ monitoring eco-technologies ‘made in Europe’**

Research findings in support of the EU Air Quality Review Process

EU Air policy implementation and review

AIM:

"a robust EU Clean Air package, updating existing policies and directives including the National Emission Ceilings Directive according to latest science, and outlining further cost-effective measures to move much closer to the related 6EAP's objective:

to achieve levels of air quality that do not result in unacceptable impacts on, and risks to, human health and the environment."

Objectives

Identify key scientific messages relevant for the revision and implementation of EU Air Quality legislation

Detailed descriptions of the research will be referenced rather than included explicitly in the document.

Identification of limitations to knowledge and emerging issues

Contributors

DG RTD , DG JRC , DG ENV, DG SANCO, EEA,WHO, IAASA.

Accent+, Actris, AirMonTech, Citizen, Eclaire, Eclipse, escape, Eucaari, Heimtsa, Hereplus, Hitea, Intarese, Megapoli, NitroEurope, Officeair, Pegasos, Purge, Transphorm, Urgenche.

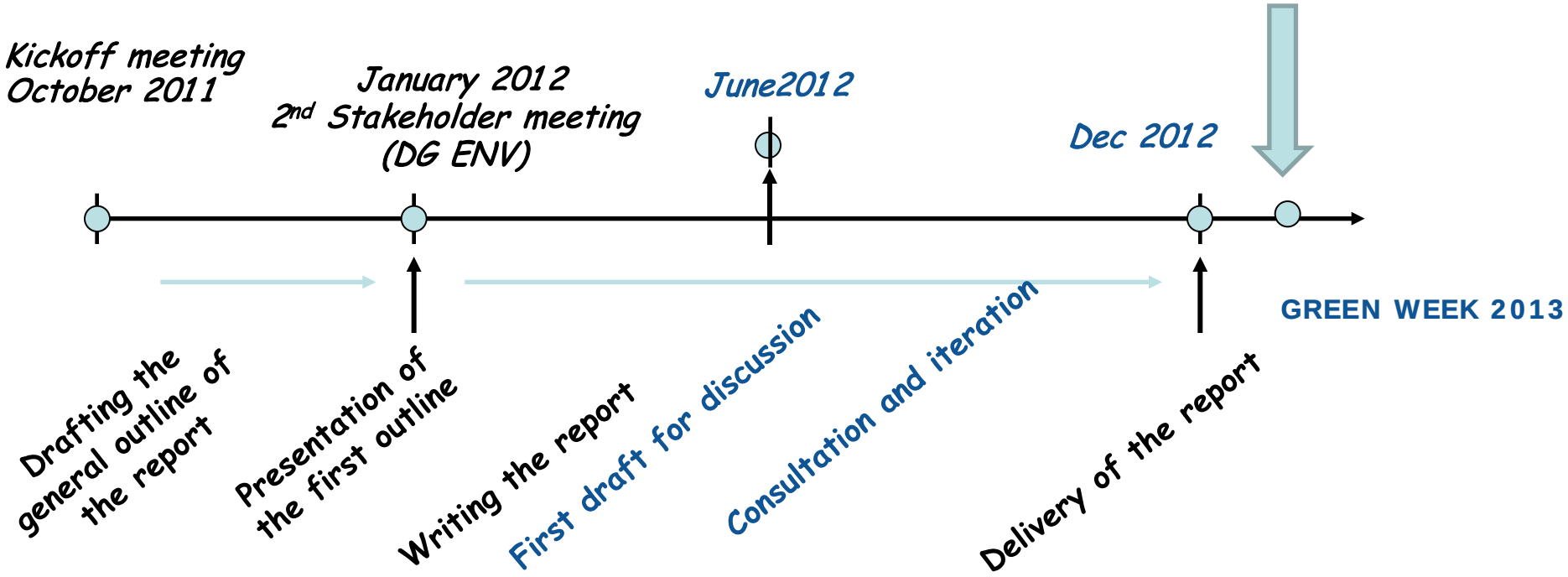
The wider literature

The Chapters

Air quality and health	*B. Brunekreef et al*
Particulate matter	*S. Fuzzi et al*
Ozone	*P.S. Monks et al*
Nitrogen	*M.A. Sutton et al*
Air quality and climate	*G. Brasseur et al*
Integrated Assessment	*R. Friedrich et al*

Priorities for further research

Air policy related research outputs from the EU RTD projects



Research Priorities - Air Quality Monitoring (AIRMONTECH)

Gaps in information related to spatial and temporal variations of exposure to health-relevant air pollutant metrics. Routine monitoring should address multiple purposes e.g. compliance assessment, effectiveness of AQ action plans, routine health monitoring and assessment, and impact assessment.

Research Priorities - Air Quality Monitoring (AIRMONTECH)

Black carbon (calibrated vs. elemental carbon, EC) is one promising additional air quality parameter to be regulated in revised AQ standards. (high cause-effect relationship with health outcomes). It is also relevant that, aside from the health aspect, high time resolution instruments are available to monitor BC, and this is a good indicator of the impact of road traffic on air quality in urban areas.

Black Carbon / Elemental carbon could therefore be one of the first parameters tested

HORIZON 2020 – Specific programme

Main references to 'air quality':

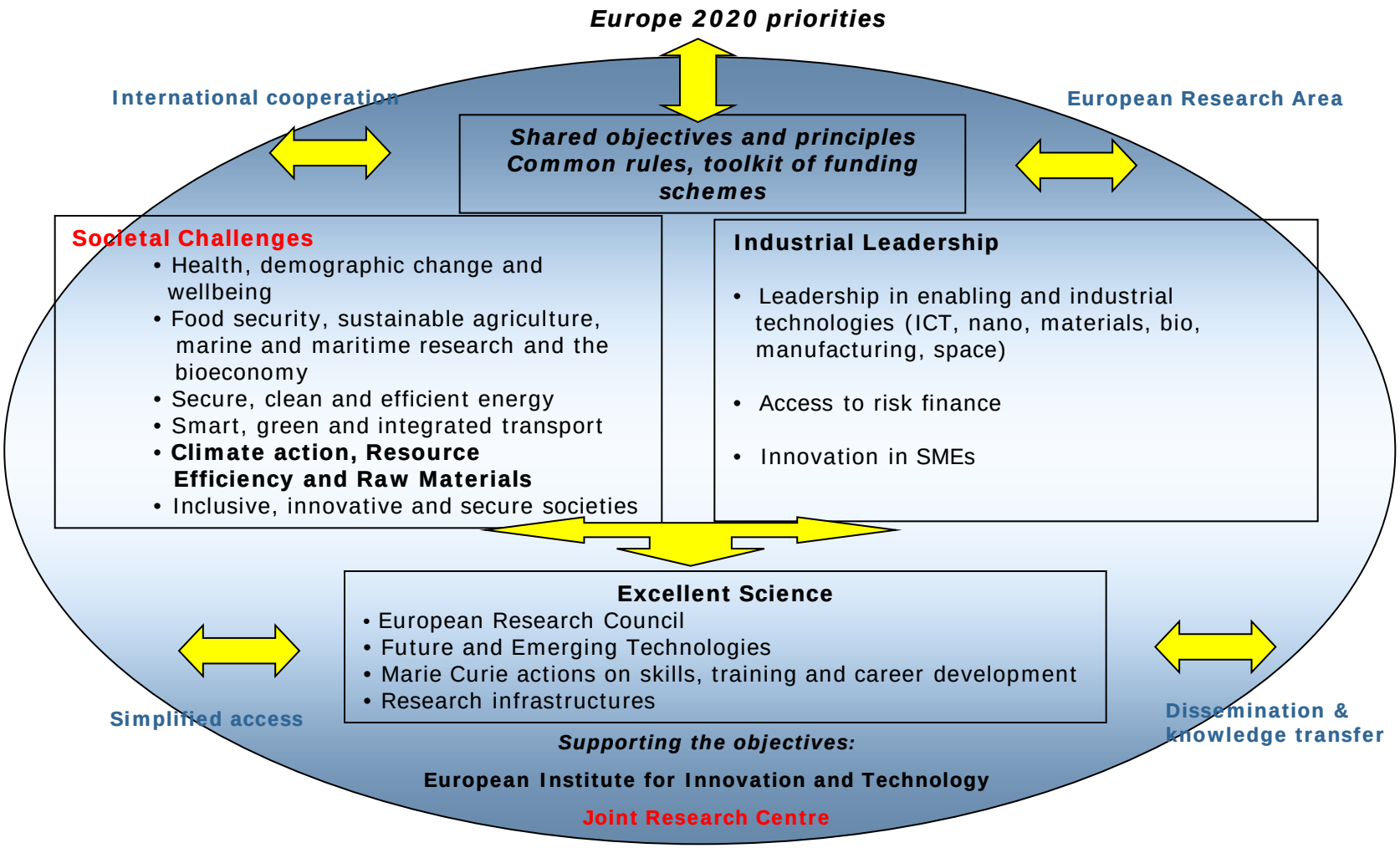
- Challenge 3 – ENERGY
  3.1.3 Foster European smart cities and communities
  -> Reduced energy consumption, energy and air quality, ICT for a low Carbon society

- Challenge 4 – TRANSPORT
  4.1 Resource efficient transport and mobility in urban areas
  -> New mobility concepts to reduce air pollution and noise

- Challenge 5 – CLIMATE CHANGE, RESOURCE EFFICIENCY AND RAW MATERIAL
  5.2 Sustainably managing natural resources and ecosystems
  -> Air as a natural resource, air quality and ecosystem services
  -> Eco-innovation

- Non-nuclear direct actions of the JRC in support of challenge 5
  Air quality thematic models as part of an intergrated modelling framework for sustainable assessment

Horizon 2020



Thank you
for your attention