Green Week 2013
Session 7.3
Perspectives for the future – a research agenda for EU air quality.

Clean Air Research Agenda

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Research needs in a policy maker's top-down perspective.

Key principles for policy making

- High level of protection for people and ecosystems
- Polluter-Pays Principle
- Precautionary Principle and "cost of inaction"
- Take action at the source
- Principle of effectiveness, efficiency and proportionality
- Knowledge-based approach ("best available science")
Research needs in a policy maker's top-down perspective.

Key questions for policy making

• What are the "problems" and how large are impacts?

• What information is needed to initiate or reinforce policy action (e.g. legislation and other means)?

• What quantifications and assessment of uncertainty are needed for the policy?

• What policy options are available? What are the impacts (environmental, economic, social)?

• How do policy options affect competitiveness (sectoral, national, EU, Int'l)
DPSIR - A framework for policy

Drivers

Pressures

State

Responses

Impact
The EU Air Quality Policy Framework

**PSI**

- **Environment**
  - PM
  - SO$_2$
  - NH$_3$
  - CO
  - NO$_x$
  - NMVOC

- **Health**
  - Acidification
  - Eutrophication
  - Ozone
  - Biodiversity

- **Energy**
  - Global Warming

- **Waste**
  - Waste

- **Transport**
  - Transport

- **Industry**
  - Industry

- **Other**

- **Multi-sectoral**
  - Agriculture
  - Energy
  - Transport
  - Industry
  - Waste
  - Other

- **Multi-pollutant**
  - PM
  - SO$_2$
  - NH$_3$
  - CO
  - NO$_x$
  - NMVOC

- **Multi-effect**
  - Acidification
  - Eutrophication
  - Ozone
  - Biodiversity
  - Global Warming

- **2020 Resource Efficiency & Green Economy**
  - Cost-effectiveness

- **EU Treaty / 6th Environmental Action Plan**
  - Science-based

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*European Commission*
Research needs on Drivers and Pressure

**Key needs**

- All economic sectors are relevant
- How will the economic sectors develop and adapt?
- What is the relationship between driver and emissions?
- Better estimates of the emissions, in particular for PM and its components (e.g. BC, metals, UFP, wildfires)
- Better estimates for other, gaseous pollutants (VOC, SLCP, reactive nitrogen)
Research needs on State

Key needs

- Refinements on air quality assessment and exposure
- Smart monitoring of air quality by ground-based local and remote-sensing methods
- Assimilation in models (with monitoring and emission data) for improved accuracy
- Short-term and long-term AQ forecasting capacity
- Better understanding of sources of various fraction of PM (source apportionment and exposure patterns)
- Interlinkages with climate (SLCP)
Research needs on Impacts

Key needs

- Refinement of air pollution impact of health and environment
- Strengthening the observational database (epi and tox) for PM and their fractions to establish CRF and causality
- Mortality and morbidity risk factors of long term (independent) NO2 and ozone exposure
- Effects of NO2 exposure in particularly polluted environments, in particular living close to busy roads, and short term exposure to extreme levels
- Environmental impacts of reactive nitrogen and interlinks with climate/global change
Research needs on Response

Key needs

- Refinement on mitigation and adaptation options and measures
- Improved integrated assessment for policy action from EU to local scale, including socio-economic aspects
- Improved understanding on instruments and "markets", expenditures
- Integration of AQ aspects into other policy areas
- Innovation for solving "problems", PIAs, platforms, tools, greening of the economy, clean transport and energy
Conclusion

- Policy needs largely coincide with "bottom-up" needs
- Reinforced understanding on Drivers, Pressure, State and Impact
- Better understanding of the Response options and implications for society (also the winners)
- Quantitative integrated assessment of knowledge for policy-making, including also "robustness/uncertainty" assessment. Also for the national and local action.
- Innovation is key to solve our problems (survey of new solutions)
- "Clean Air Research and Innovation Agenda" in connection with the 2013 Air Policy Package