Air pollution in Europe and Asia
From Science to Policy

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Mitigation of Air Pollution and Greenhouse Gases

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IIASA’s GAINS systems approach to identify cost-effective emission reduction strategies

- Energy/agricultural projections
- Emission control options (~2000 measures)
  - Emissions (10 pollutants)
  - Costs
- Atmospheric dispersion
- Air pollution impacts, Basket of GHG emissions
- GAINS Optimization
- Environmental targets
GAINS - the central analytical tool for air pollution negotiations in Europe

Convention on Long-range Transboundary Pollution
1993  Second Sulphur Protocol
1999  Gothenburg Multi-pollutant/Multi-effect Protocol
2012  Revised Gothenburg Protocol

European Union
1995  EU Acidification Strategy
2001  National Emission Ceilings Directive
2005  Thematic Strategy on Air Pollution
2013  Clean Air Policy Package
The EU Clean Air Policy Package 2013

17 IIASA reports informing Commission, Council and Parliament

Costs and benefits of further emission reductions in 2030

- Health benefits
- Emission control costs
- Economically rational ambition level
- Commission proposal
- Marginal emission control costs
- Marginal health benefits
The EU Clean Air Policy Package 2013

IIASA’s 2014 Impact Assessment for European Parliament on implications of the Climate and Energy Policy package

Costs and benefits of further emission reductions in 2030
GAINS: From uncertain climate impacts of pollutants to robust win-win measures with climate co-benefits

16 practical measures that improve human health, increase agricultural productivity and reduce near-term temperate increase:

- Transport:
  - Diesel engines, high-emitting vehicles
- Oil and gas sector:
  - Venting, flaring, distribution losses
- Waste management:
  - Recycling, wastewater treatment
- Heating and cook stoves:
  - Clean stoves, pellets
- Agriculture:
  - Rice paddies, anaerobic digestion, open burning of residuals
- Modern brick production and coke ovens
The Climate and Clean Air Coalition (CCAC)

- Formed in 2012 to promote implementation of these 16 measures
- Now 50 countries and 54 NGOs
- Voluntary, action-oriented, in context with other development goals
- IIASA on Science Advisory Panel
New GAINS global NH$_3$ emission inventory

Source: GAINS model; ECLIPSE V5 scenario
Is the formation of secondary inorganic aerosols in the JingJinJi region NH₃-limited?

A large fraction of PM2.5 in China consists of secondary inorganic aerosols, even during episodes.

World Bank support to China

2014: NH₃/nitrogen use efficiency adopted as the main direction for World Bank support for the JingJinJi Clean Air Action program of the Chinese government.

Air quality seen as entry point for good N management practices.
IIASA provides the key requirements for turning scientific findings into insights relevant for decision making

- Independence/perceived legitimacy of the institution
- Scientific networks involving multiple disciplines
- Quality control: Peer review + strict QAQC procedures
- Transparency, e.g., open access to models and data
- Continuous dialogue with decision makers and stakeholders