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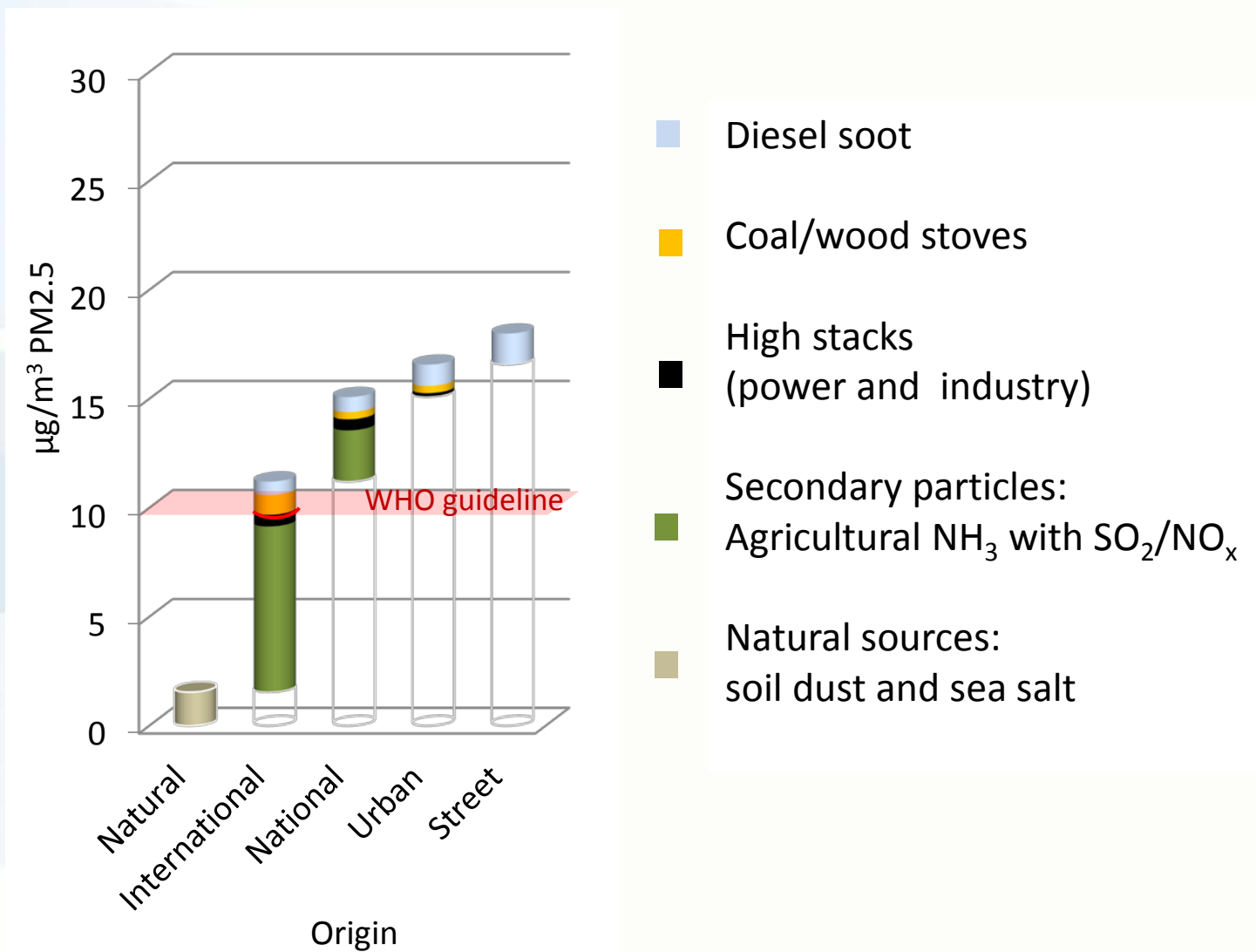
# Systems analysis for policy decisions: Lessons from the science-policy interface on air quality in Europe

Markus Amann

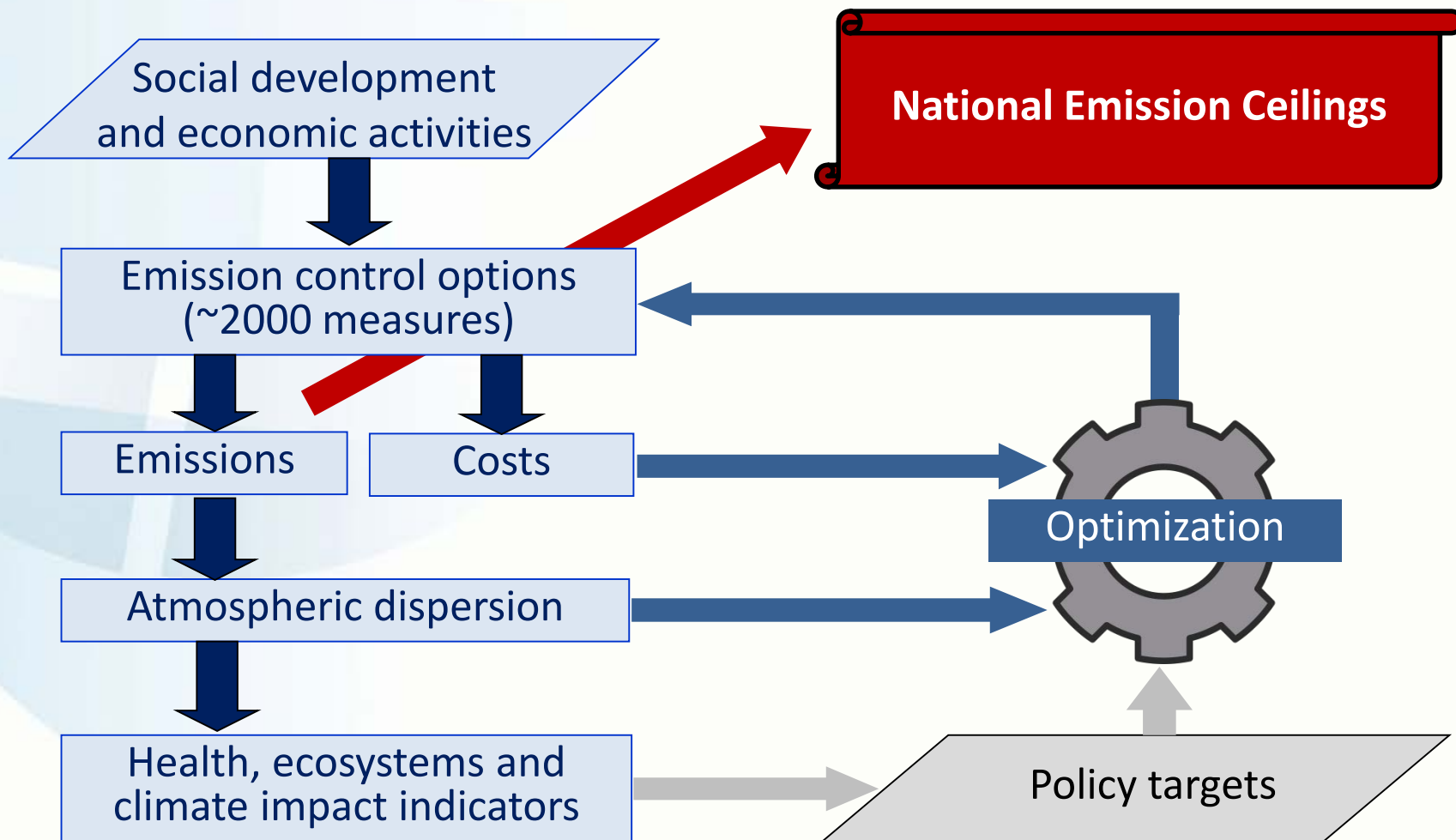


IIASA, International Institute for Applied Systems Analysis

# Origin of ambient PM<sub>2.5</sub> in street canyons in the Netherlands



# Greenhouse gas–Air pollution Interactions and Synergies: The GAINS tool



# Least-cost optimization in GAINS

**Minimize total European emission control costs:**

$$\sum_{c,p} costs_{c,p} \rightarrow min$$

**Costs are functions of emissions:**

$$costs_{c,p} = f(emissions_{c,p})$$

**subject to constraints (policy targets) on population exposure (health):**

$$\sum_{c,p} emissions_{c,p} * atm. dispersion(PM2.5)_{cc,p} \leq pop. exposure_c$$

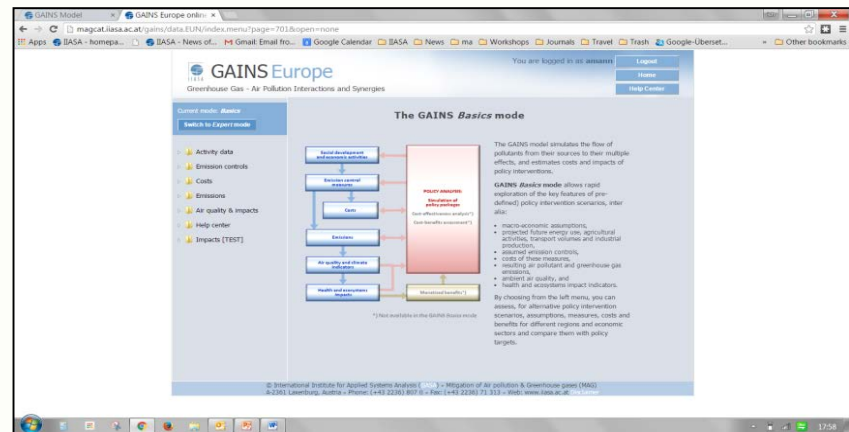
**and ecosystems impacts:**

$$\sum_{c,p} emissions_{c,p} * atm. dispersion(S/N)_{cc,p} \leq eco. impacts_c$$

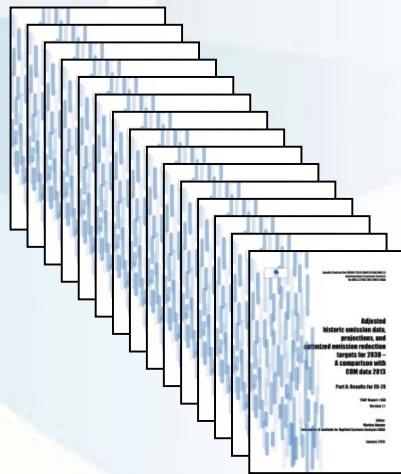
For 28/44 countries (c), 10 pollutants (p), ~2000 emission control measures in each country, considering air quality in ~5000 receptor cells

# Establishing credibility of input data

- Journal papers and scientific peer review of GAINS
- + Open on-line access to GAINS, (>1000 registered users)
- + Bilateral consultations on input data with >100 experts from all Member States



<http://gains.iiasa.ac.at>



**“Trusting Commission figures is like trusting Zimbabwean President Robert Mugabe to monitor the stock of elephants.”**

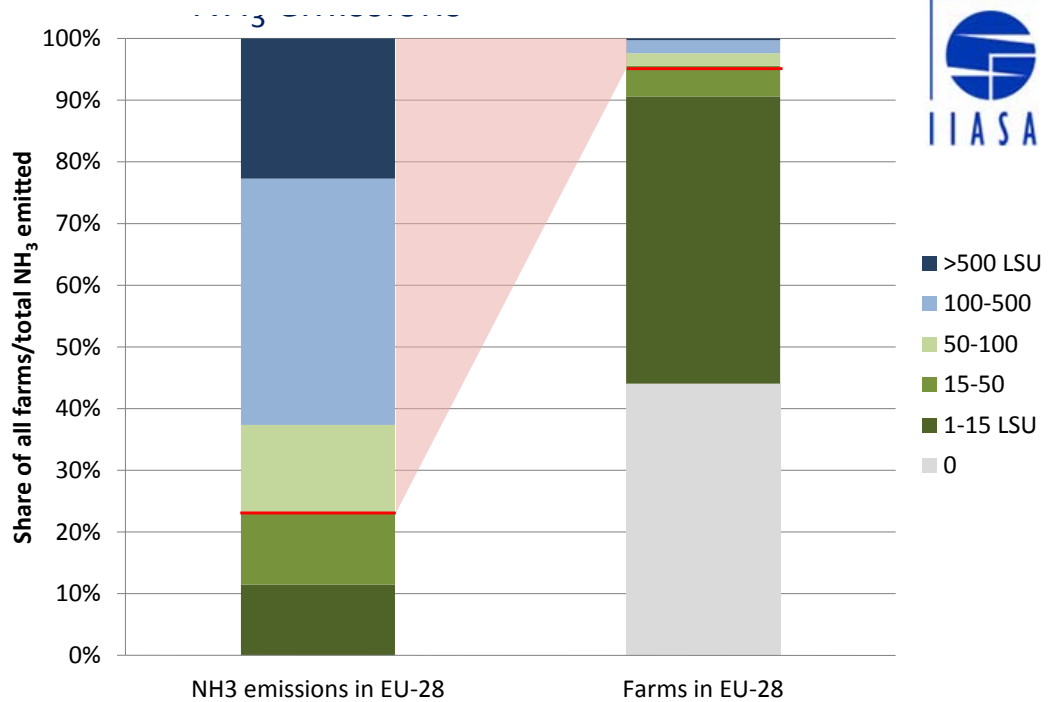


- + 16 policy reports for stakeholders, with feedbacks from Member States

Olaf Stuger  
(Partij voor de Vrijheid, NL)



# Farming lobby t emissions capp



**80% of NH<sub>3</sub> emissions emerge from 5% of the farms in the EU**

# Four essential ingredients for a successful science-policy interface

- Credibility:
  - Robust science, appropriate methods, peer review
- Salience:
  - Illustrating consequences of alternative policy decisions, for diverse groups, sectors, countries
- Transparency:
  - ‘Black box’ models are not helpful
  - Limits to complexity
- Legitimacy:
  - Participatory process, not one-time publication
  - Institutions (IIASA serves as an impartial broker)