National Institute for Public Health and the Environment (RIVM)
Ministry of Health, Welfare and Sport
The Netherlands

EPCAC –

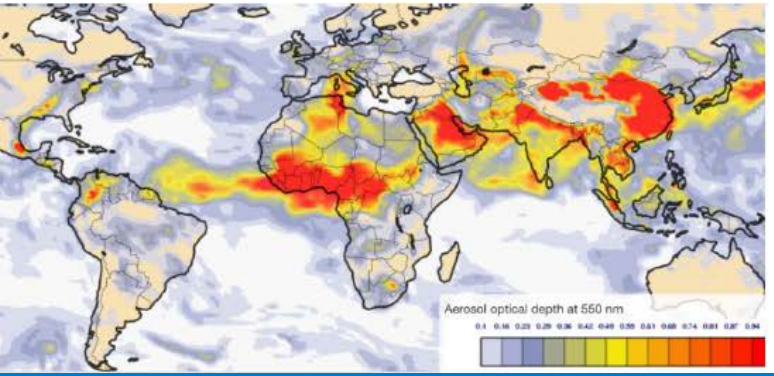
Expert Panel on Clean Air in Cities

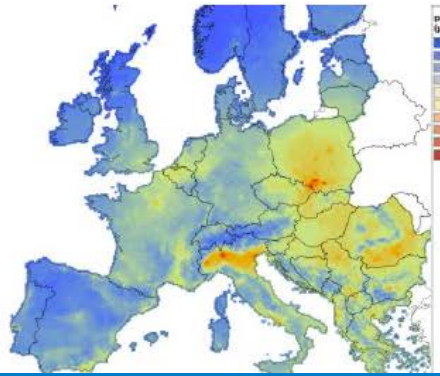
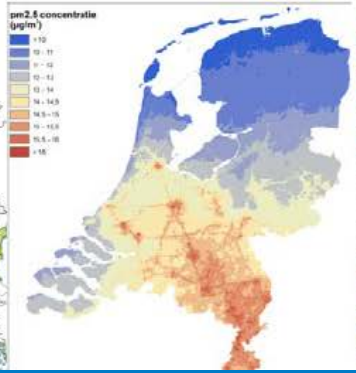
Co-chairs:
Guus Velders
Roald Wolters

Expert Panel on Clean Air in Cities

- Adopted by the Executive Body of the UNECE Air Convention, Dec 14, 2018
- Under: Task Force Integrated Assessment Modelling
- Revised TFIAM mandate:

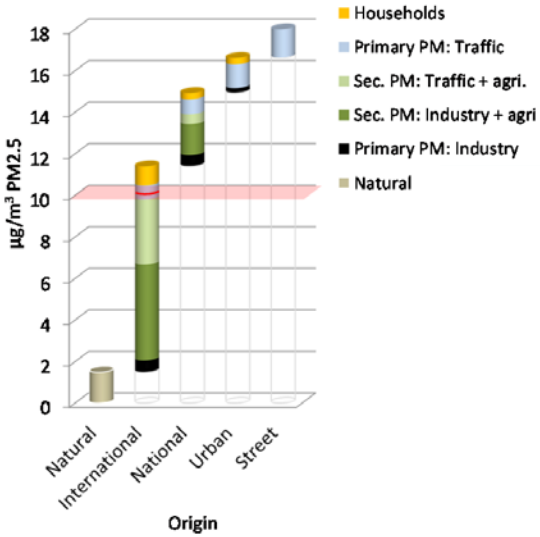
“Multi-scale multi-objective assessment modelling aimed at cost-effective policy strategies that combine international, national and local actions as well as the links between air quality policy and other policy processes (e.g. on SDGs, climate, biodiversity).”



Rationale

1. Most people exposed to air pollution live in urban areas
2. Air quality in cities is influenced by transboundary sources
3. Activities, emissions and measures in cities also influence air quality in other cities
4. Co-operative actions at all government levels will benefit cities (improve air quality at lower costs)
5. Synergies with other policy objectives would increase effectiveness (e.g. objectives for transport, energy, agriculture)
6. The expertise on *multi-scale multi-objective* assessment modelling and governance should be strengthened

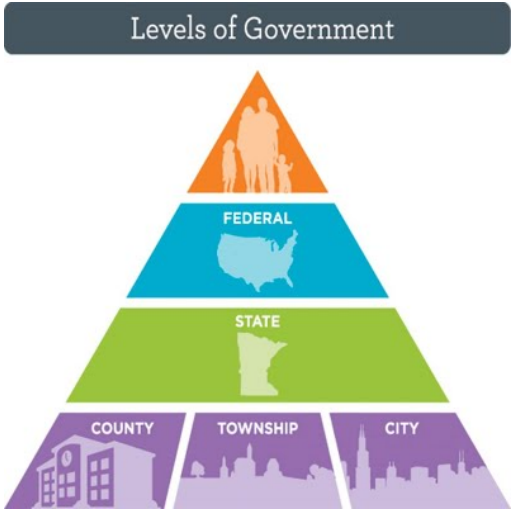


IIASA

Key questions

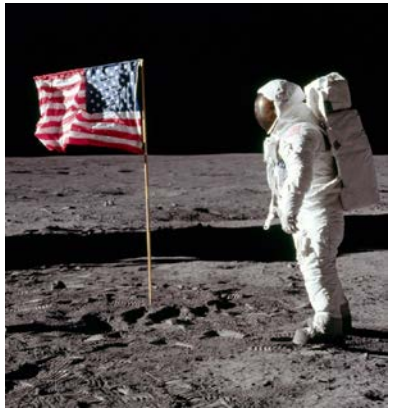
- Which actions at which government level are most effective to reduce health effects?
- Can we say more about the cost-effectiveness on measures at different government levels?
- What knowledge should be improved for robust policy advice?

  (e.g. on emissions, dispersion, health impacts, efficient measures, multi-scale multi objective policy design, …)



Mission and Task

- EPCAC will provide a science-policy arena for analysis of cost-effective multi-scale air quality strategies
- EPCAC will highlight the interactions between geographical scales, acknowledging that air quality on a local scale is affected by international policies whilst the impact of local policies is propagated to other cities, regions and countries.



Task:

1. Form a community of experts
2. Advice the Working Group on Strategies and Review
3. Advice the joint EMEP-Steering Body and Working Group on Effects
4. Build upon the knowledge in existing Task Forces and networks
5. Refer parties and international organizations to available

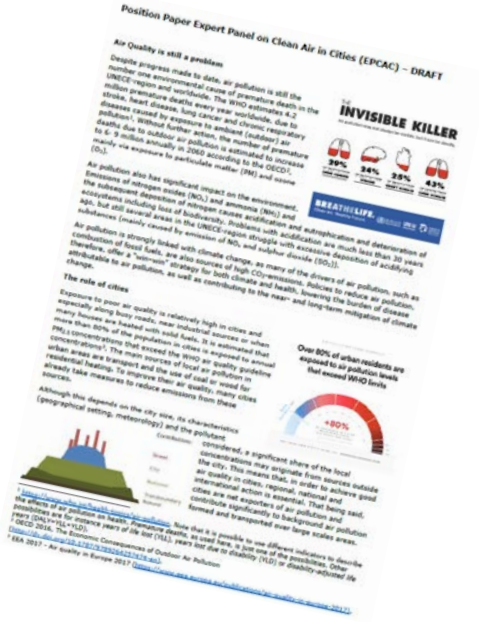
Deliverables

1. Prepare a **position paper:** raise awareness of the multi-scale interactions
2. Organize **annual workshops:** exchange knowledge and experiences
3. Ensure a **database** is maintained: available (non-)technical measures (indication of effectiveness, costs)
4. Develop illustrative optimized **scenarios** for health improvement through clean air in cities
5. **Participate** in the work of relevant Task Forces to strengthen the knowledge
6. Actively **disseminate knowledge** to parties

Highlights second EPCAC meeting

- Position paper on clean air in cities

- Online meeting in September 2020
- 16 presentations on:
  - Health and cities perspectives
  - Source apportionment of local concentrations
  - Action at city level, successes and challenges


Position Paper Expert Panel on Clean Air in Cities (EPCAC) – DRAFT

Air Quality is still a problem

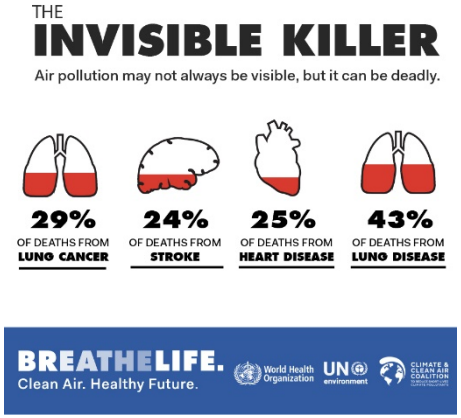
INVISIBLE KILLER

The role of cities

Presentations will be uploaded to:
https://iiasa.ac.at/web/home/research/researchPrograms/air/policy/TFIAM.html

Health impacts

- Stronger evidence of health impacts
- Impacts start at low levels (3.5 ug/m^3)
- Meeting current WHO levels would save 52,000 lives ($PM_{2.5}$) in Europe
- Meeting lowest levels saves: 126,000 lives ($PM_{2.5}$) + 82,000 (NO_2), up to 19% of annual mortality
- Use of several policy indicators



Source apportionment methods

- Harmonize: definition of “city”; choice of indicators; urban background method
- Cooperation with FAIRMODE
- Look at composition of PM during episodes
- Exposure estimates: take movements of people into account
- Align resolution of modelling with resolution in epidemiological studies

- Share of local sources in urban concentrations is limited
- Cities are exporters of pollution ➔ grid to grid modelling
- Microscale modelling needed to align modelled concentrations at hotspots with measurements

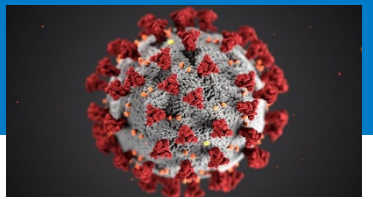
Urban actions

- Meeting limit values and beyond
- Combine cleaner air with climate friendly behaviour
- Integrated city planning approaches: green, clean, carbon neutral, …
- Get rid of the old stuff: Ultra low emissions zones, scrappage schemes (cars, furnaces)
- Attention for wood burning
- For meeting WHO-$PM_{2.5}$ level: include domestic heating (with condensables)
- Cooperation between policy levels is required
- Health impact assessments to support policy choices

Next plans

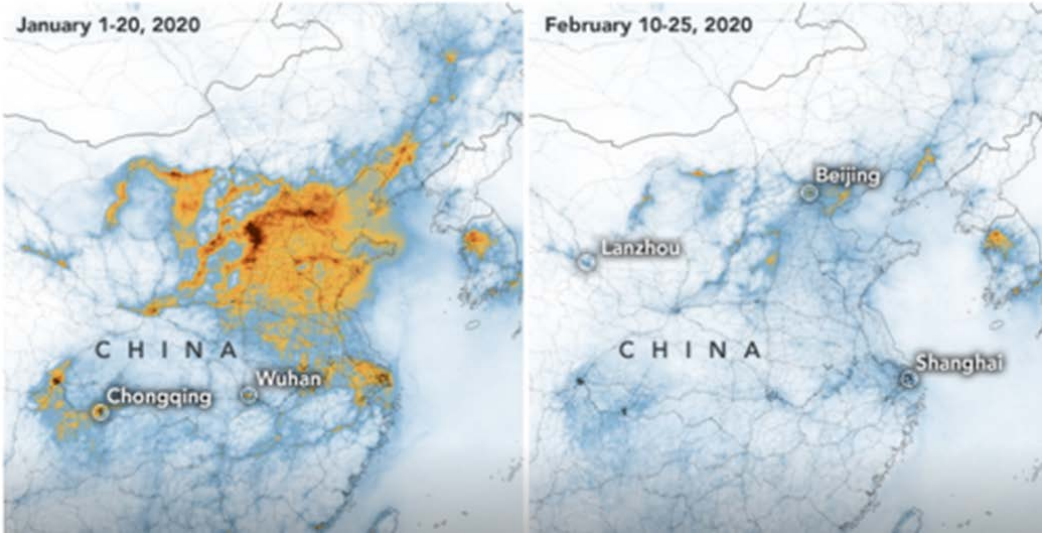
- Meeting in fall 2021
- Model comparison:
  - Define modelling setup ➔ determine annual average background concentrations of NO_2 and $PM_{2.5}$ in cities.
  - Determine sources and magnitude of background concentration of selected number of cities
  - Determine contribution to surrounding region
  - Estimate effects of local/regional/(inter)national emission reductions on concentrations in selected cities
  - Coordinate with other modelling activities

Corona lockdown as example



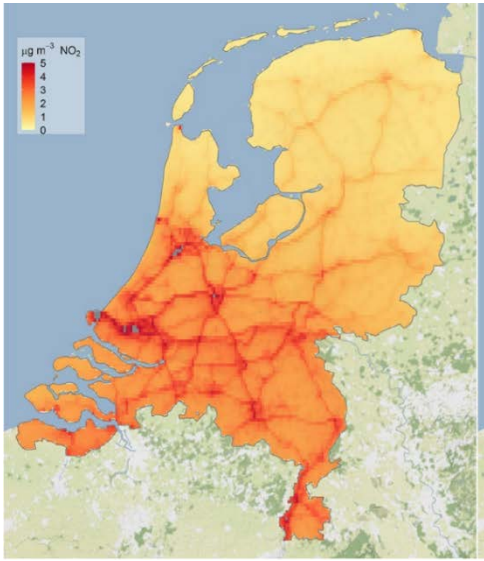
What can be achieved with large reductions in emissions?

NO_2 concentrations China, before and during the lockdown

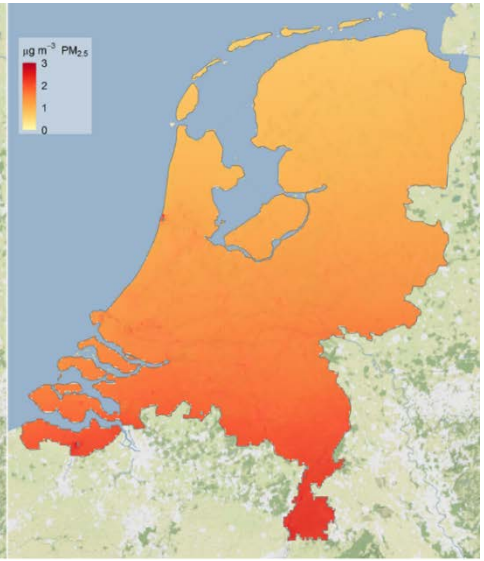


Modelled reductions: NO_2 and $PM_{2.5}$

NO_2

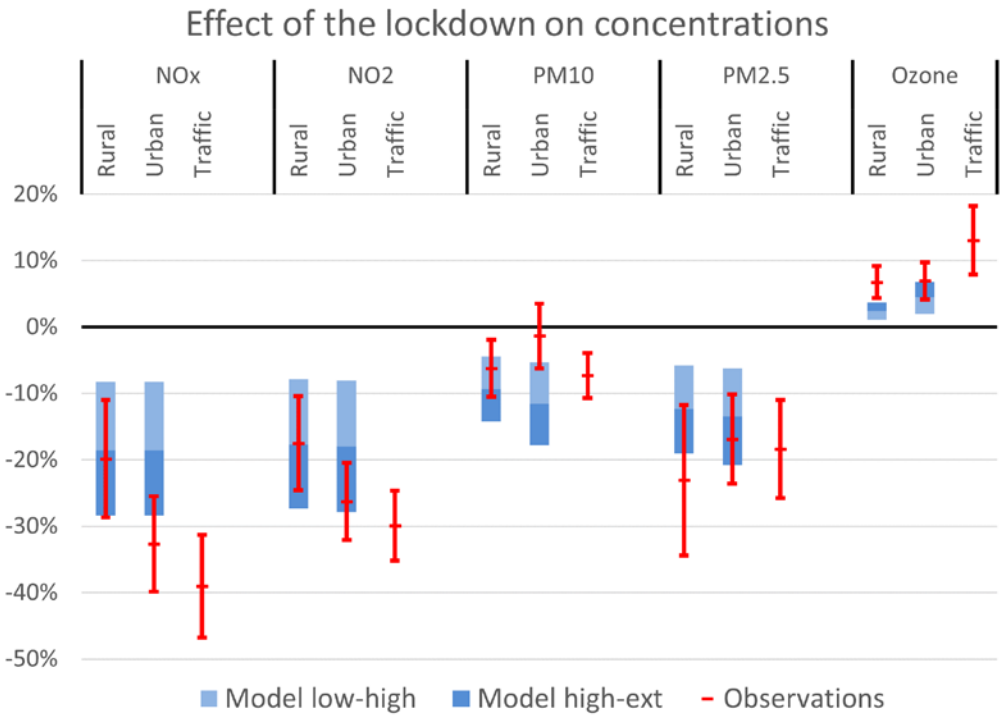


$PM_{2.5}$



Summary lockdown effect

- Blue bars: Model simulations with different scenarios (model: EMEP/MSCW-NL)
- Red lines: Statistical analysis of the observations



Source: Velders et al. (Atmos. Env., 2021)

Questions?

Dank u wel

Gracias

Danke

Merci

Diolch yn fawr

Спасибо

شكرا

谢谢

धन्यवाद

σας ευχαριστώ

תודה

terima kasih

teşekkür ederim

köszönöm

நன்றி