

Scientific Assessment Report 2016

EMEP/WGE

Convention on Long-Range Transboundary Air Pollution

18 December 2015

http://www.unece.org/fileadmin/DAM/env/documents/2015/AIR/EB/CLRTAP_Assessment_Report_2016_draft_17_December_2015.pdf

WGE trend report:

Trends in ecosystem and health responses to long-range transported atmospheric pollutants

Contributions from

ICP Forests, ICP Integrated Monitoring, ICP Materials, ICP Modelling and Mapping, ICP Vegetation, ICP Waters, JEG DM, TF Health, EMEP, AMAP



NIVA



Further credits to:

- Nordic Council of Ministers
- Switzerland
- Germany
- Sweden/IVL
- Netherlands/RIVM
- MSC-W, IIASA/CIAM, CEIP, JRC, INERIS, CEH, WHO, CCE

Assessment Report - Current Status

- SPM for comments (and inspiration) to WGSR
- Full text based on contributions of >40 co-authors
- Draft text on web → comments < 15 Febr

To do:

- Include texts from US/CAN → early Febr 2016
- Add references; distinction UNECE-Europe <-> EU
- List of abbreviations

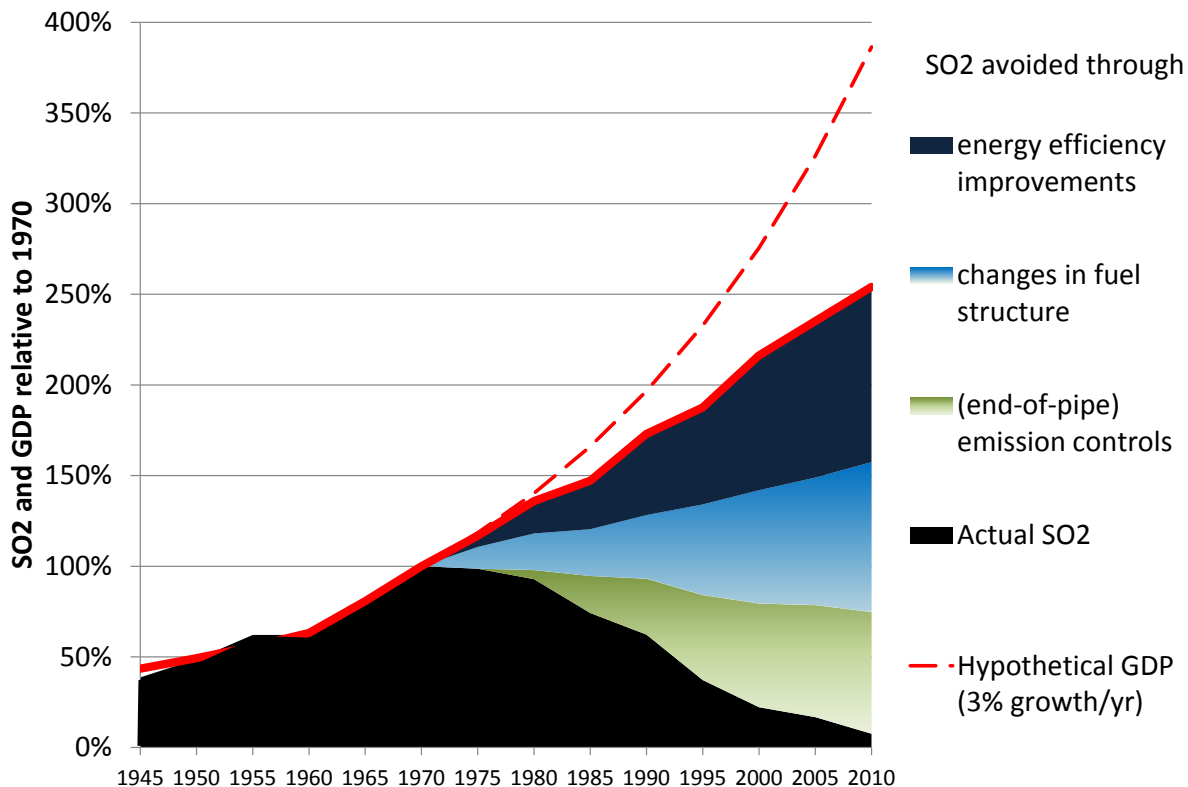
Questions to WGSR/EB

1. What is missing?
2. Does the summary have the right focus?
3. Does it help in further developing policies?
4. What policy priorities do *you* derive from the assessment?
5. What priorities for further work do you see?

How would the world have looked without air pollution policy?

Policy action was an important driver for the decline in past emissions

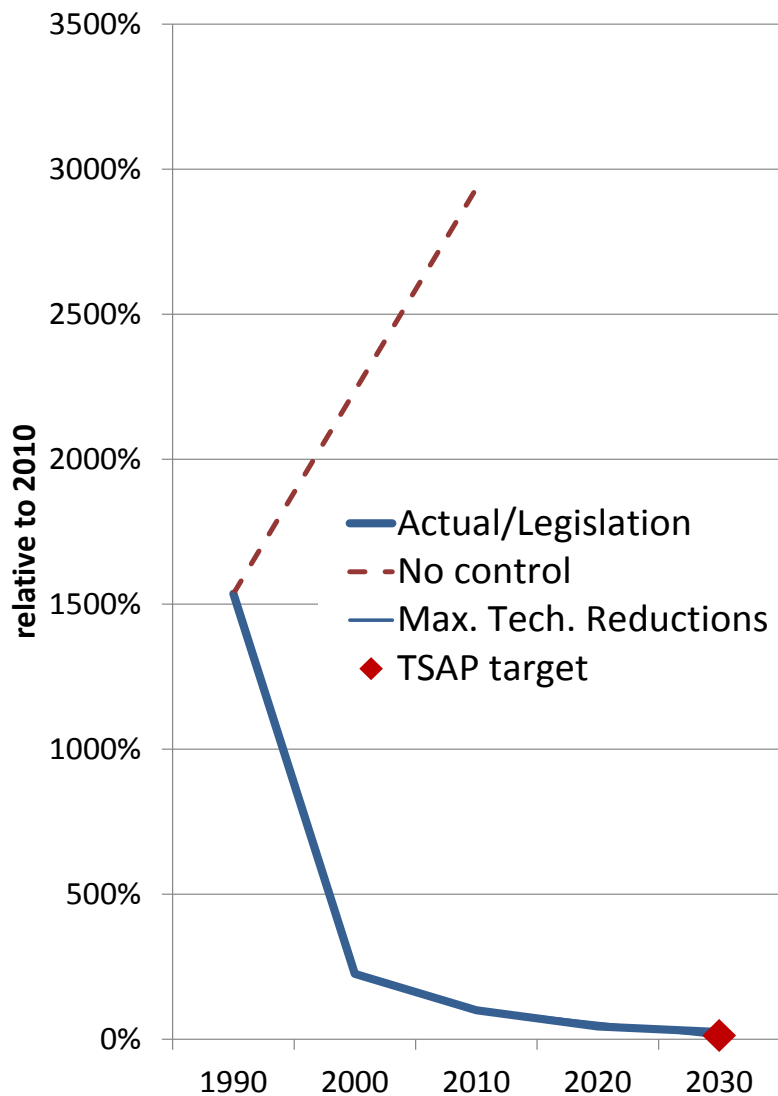
Decoupling between GDP and SO₂ emissions in Western Europe



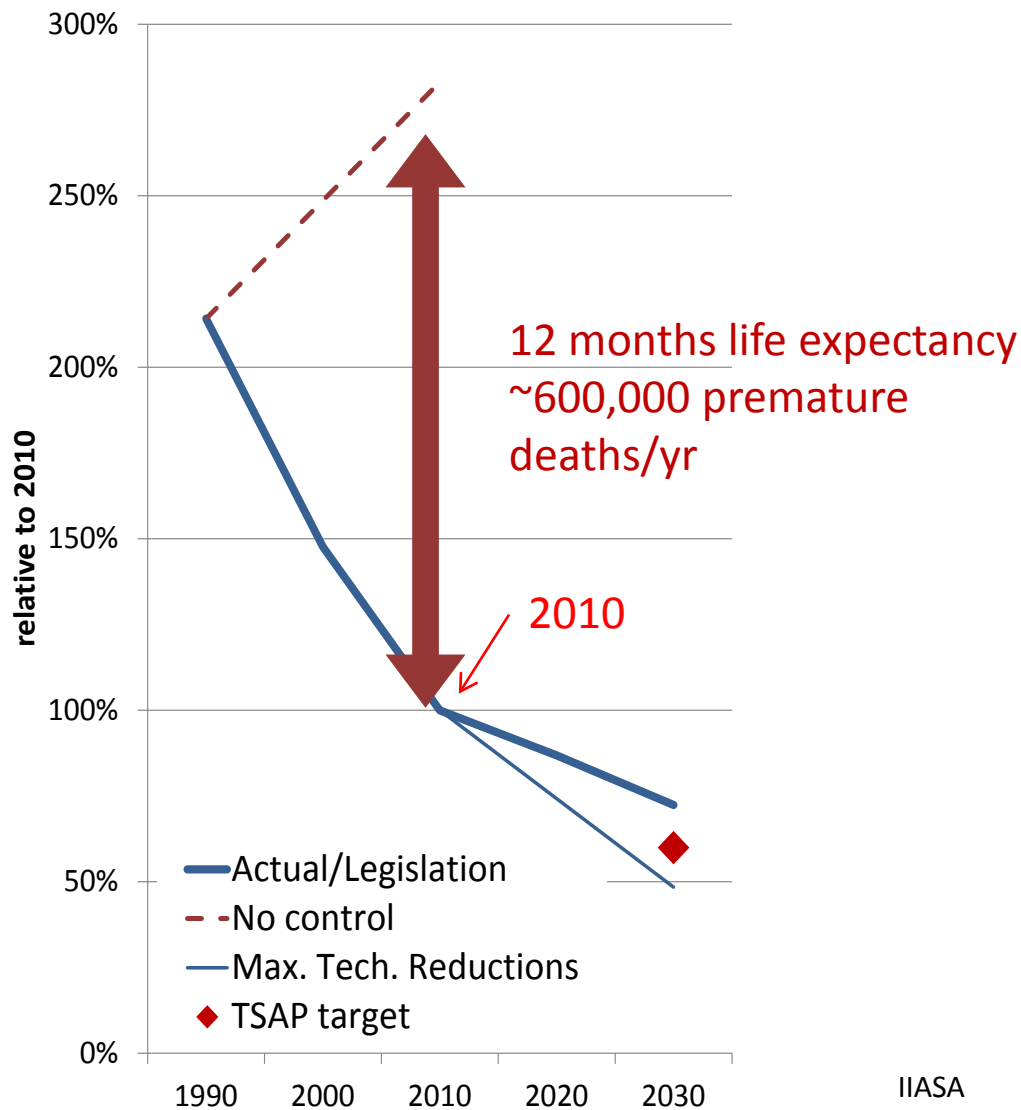
Sources: Rafaj et al., (2014) *Clim.Change* 24(3)477-501
(2014) *Sci.Tot. Env.* 41.

Air pollution impacts 1990-2010-2030 (EU28)

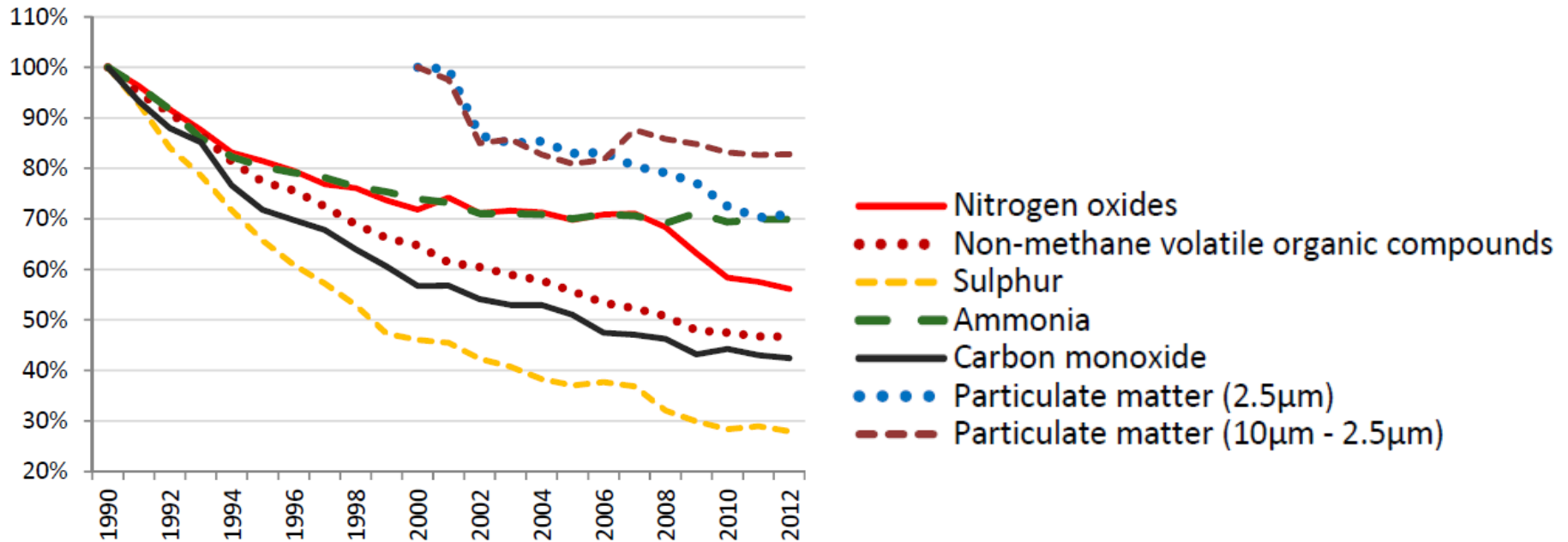
Acidification (excess dep.)



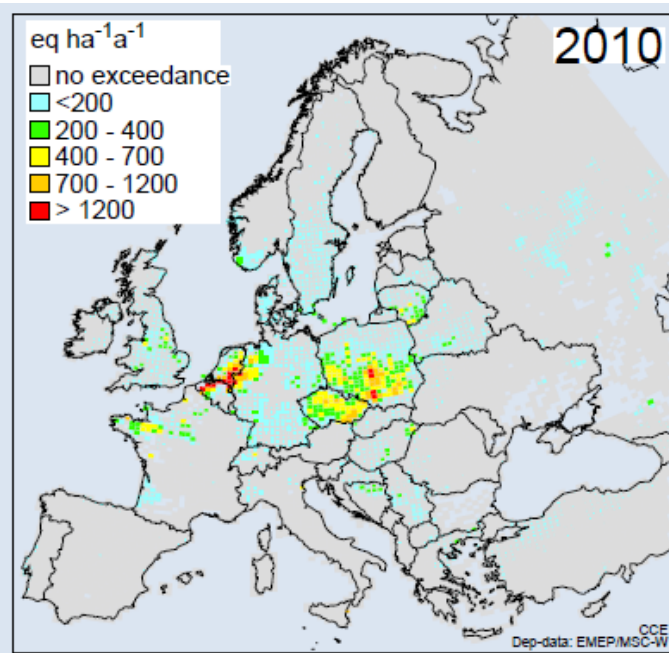
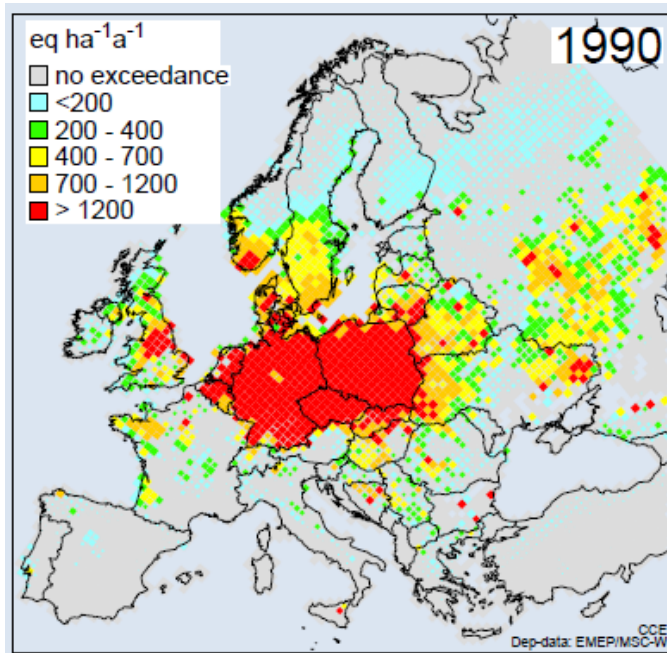
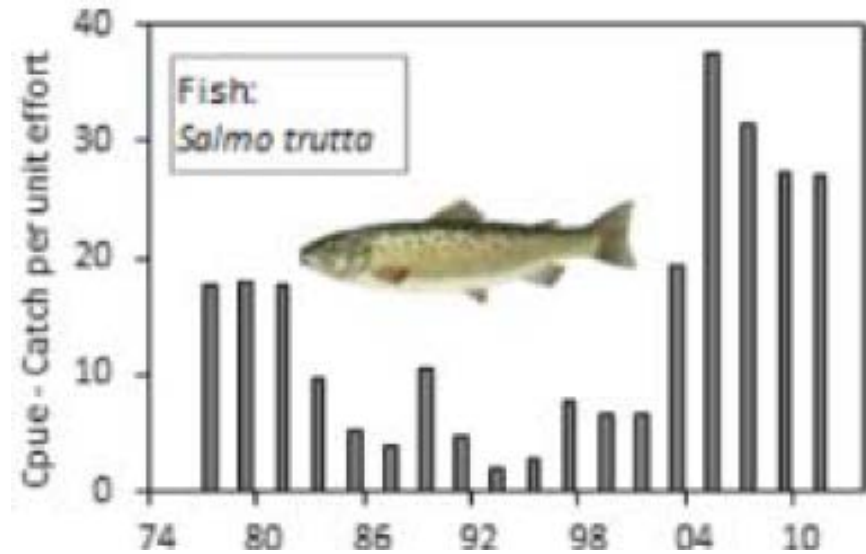
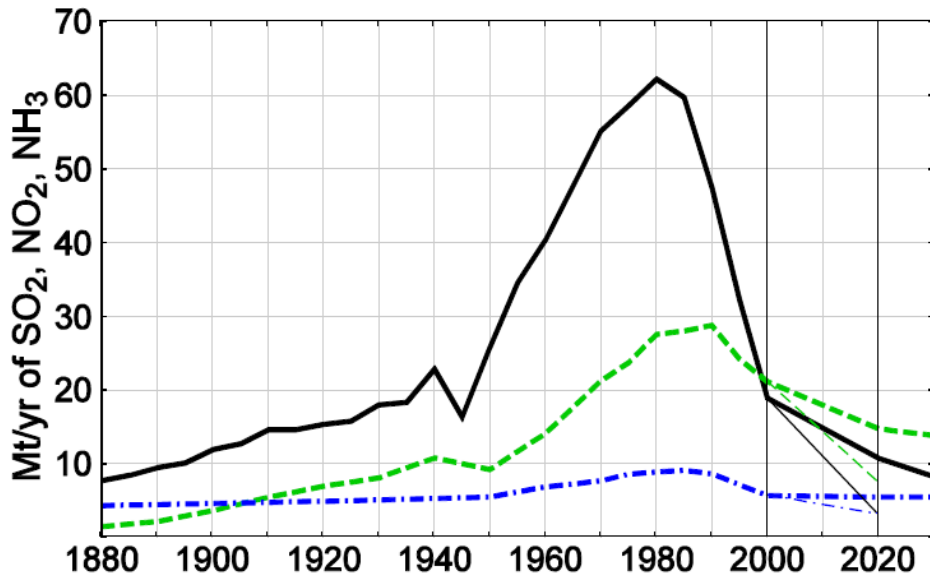
Population exposure PM2.5



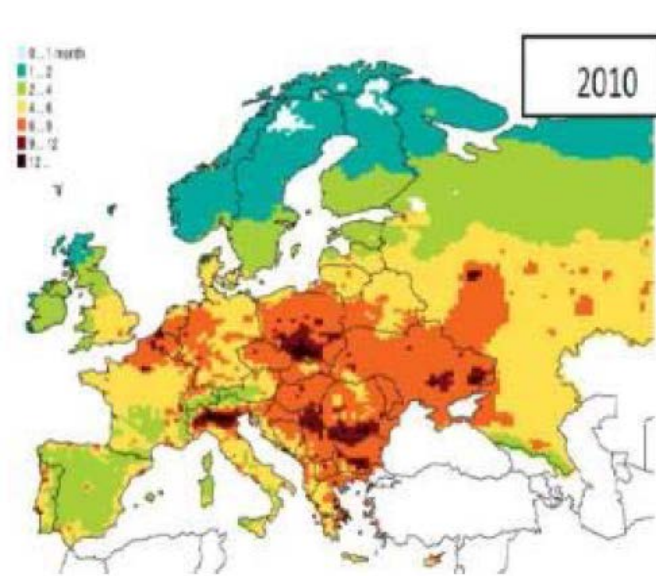
Some pollutants seem easier to reduce



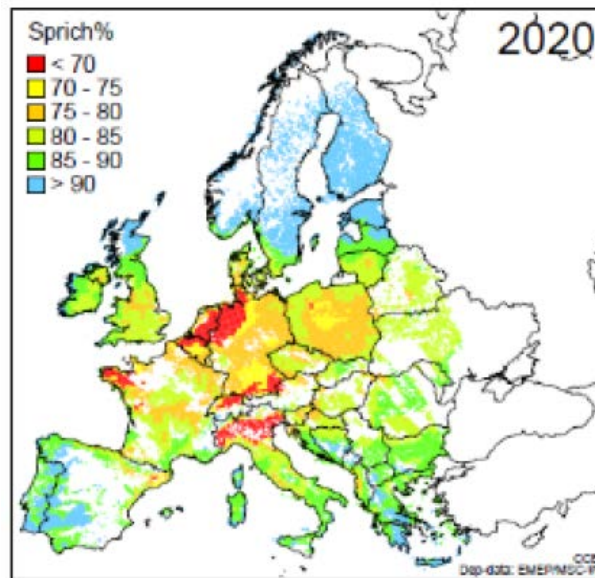
Acidification: large improvements



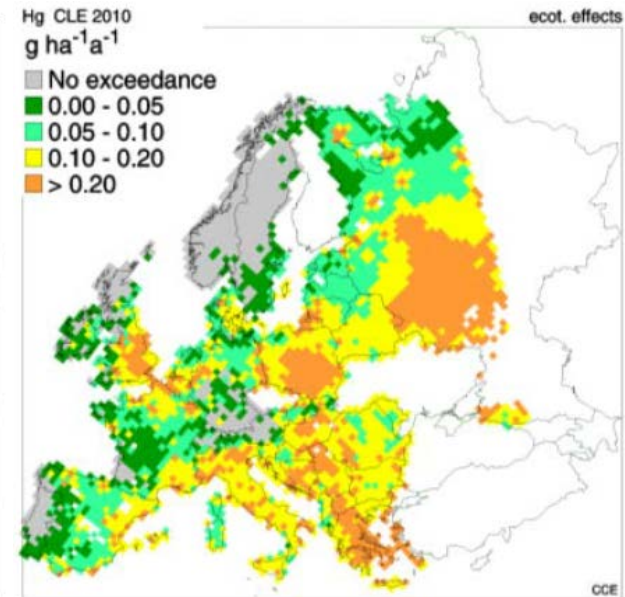
Unfinished work: Particulate Matter, Nitrogen, Ozone, HM&POP



Loss of life expectancy
(months)

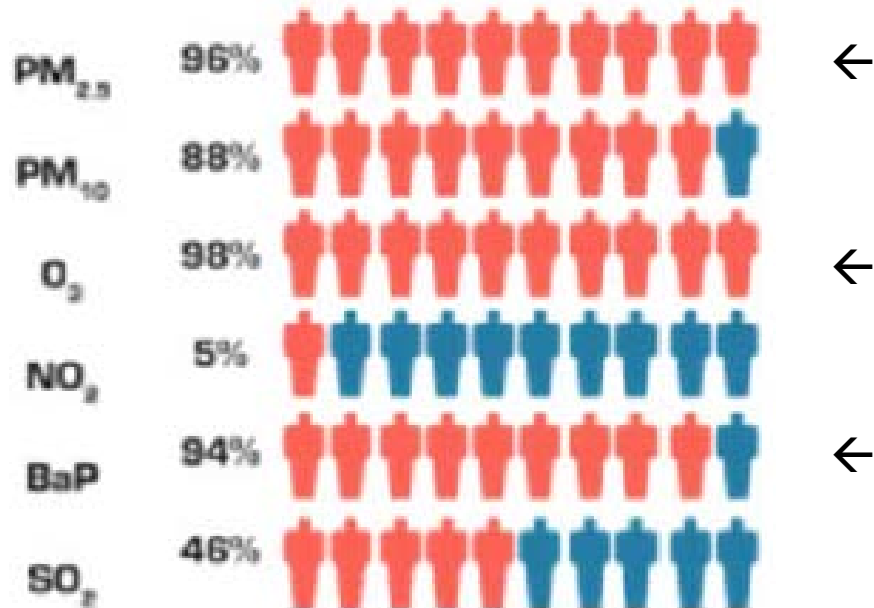


Plant species loss
(% protected)

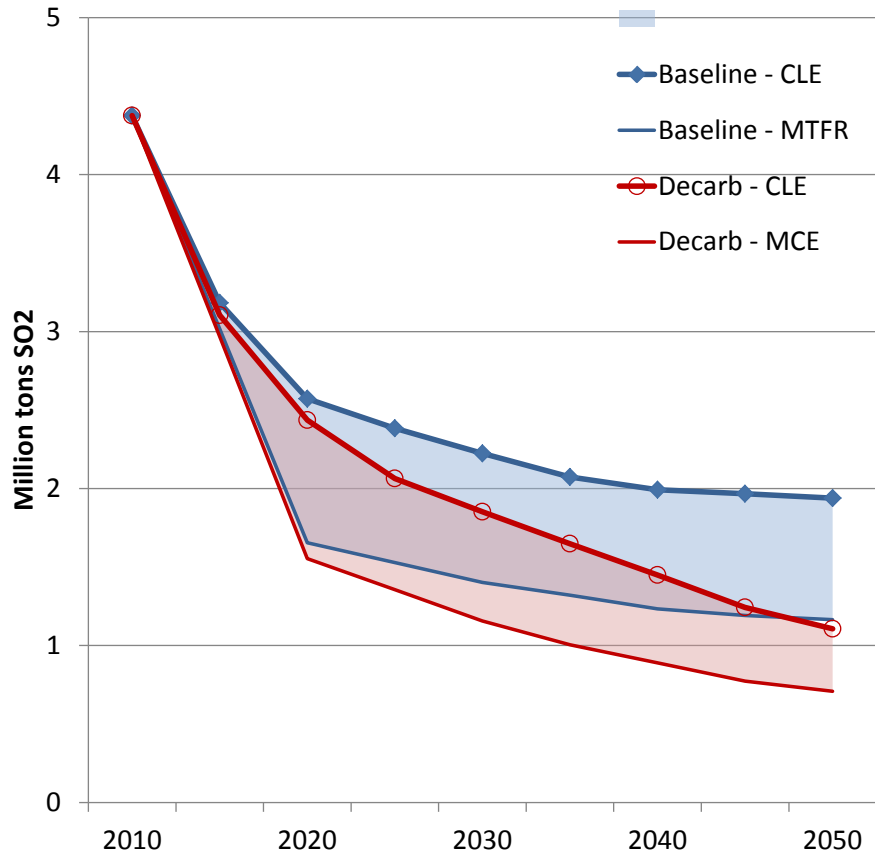


Mercury accumulation in soil
(CL-exceedance)

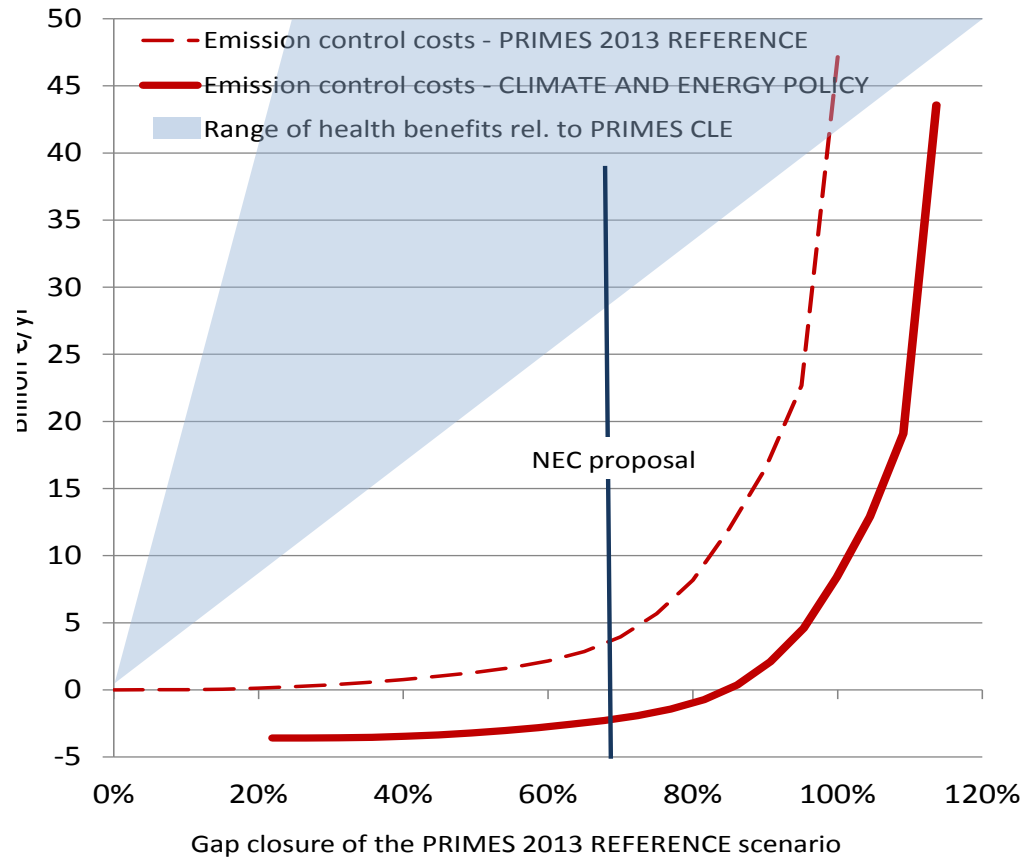
Majority of the EU population is exposed to concentrations above WHO guideline levels



What will COP21 contribute?



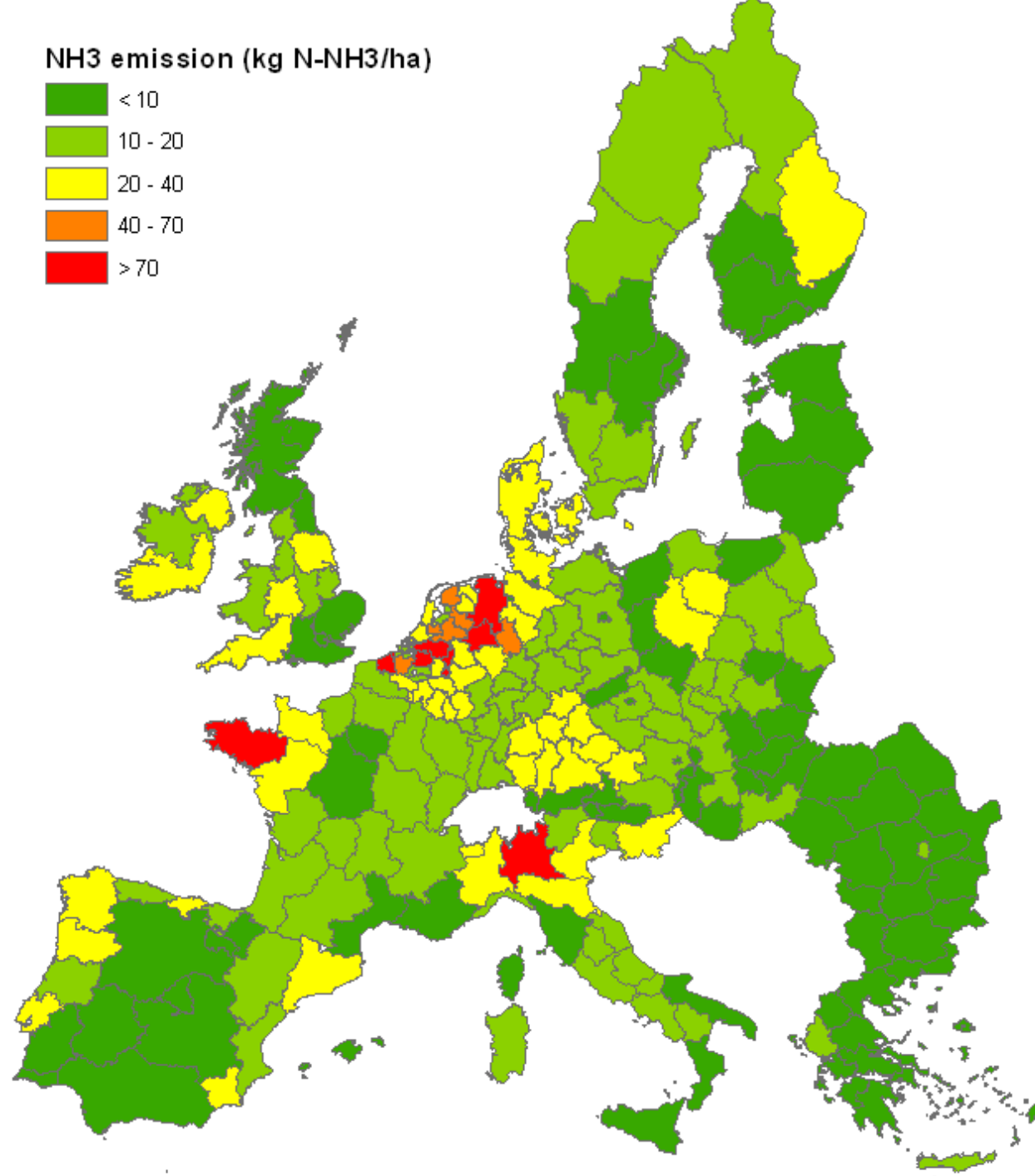
MTRF = CLE with climate policy
 15-20% higher reduction potential for SO₂, NO_x, VOC and PM_{2.5}



Substantial lower control costs:
 80% gap closure without net costs

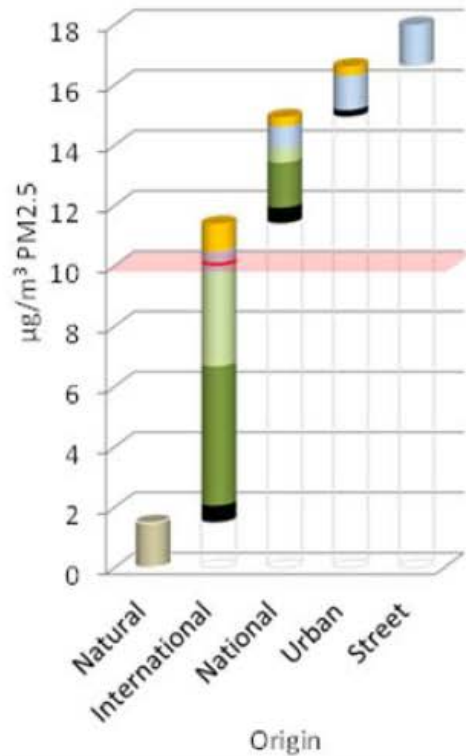
Based on IIASA calculations in 2014

**Ammonia
remains a
challenge for
ecosystems
and health**

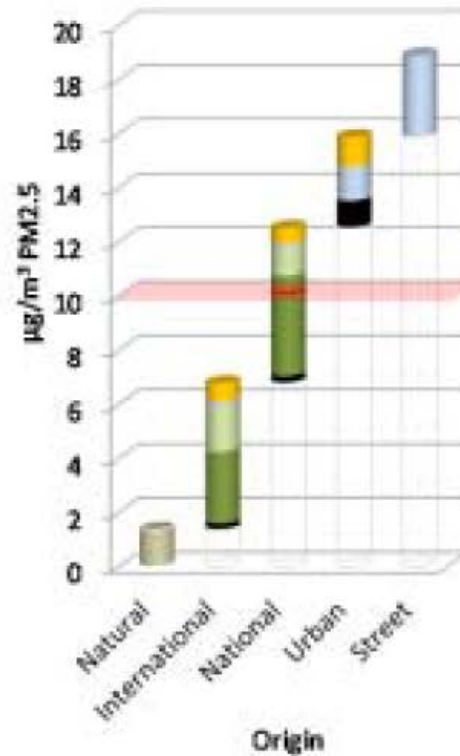


International cooperation remains necessary to reduce secondary particulates

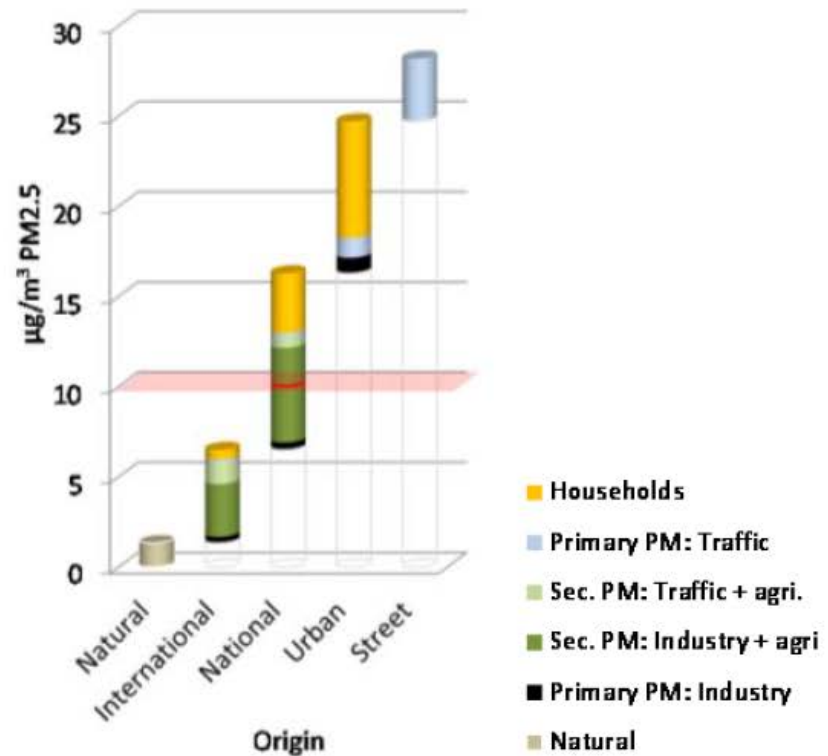
Netherlands



Germany

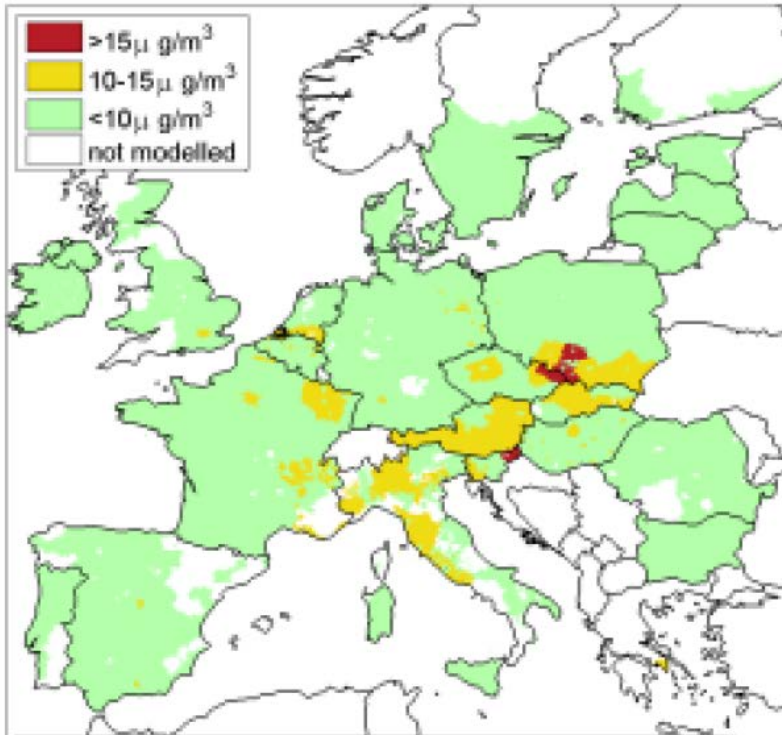


Poland



- Households
- Primary PM: Traffic
- Sec. PM: Traffic + agri.
- Sec. PM: Industry + agri
- Primary PM: Industry
- Natural

PM2.5-exposure : actions possible at different levels



2050 scenario:
Climate & Energy Policy +
MTFR-measures are needed
to meet WHO PM2.5- guidelines
almost everywhere

Continental

1. Euro-6 standards work in reality
2. Implementation climate & energy targets
3. Emission-standards for e.g. wood burning
4. Emission-standards for large cattle farms

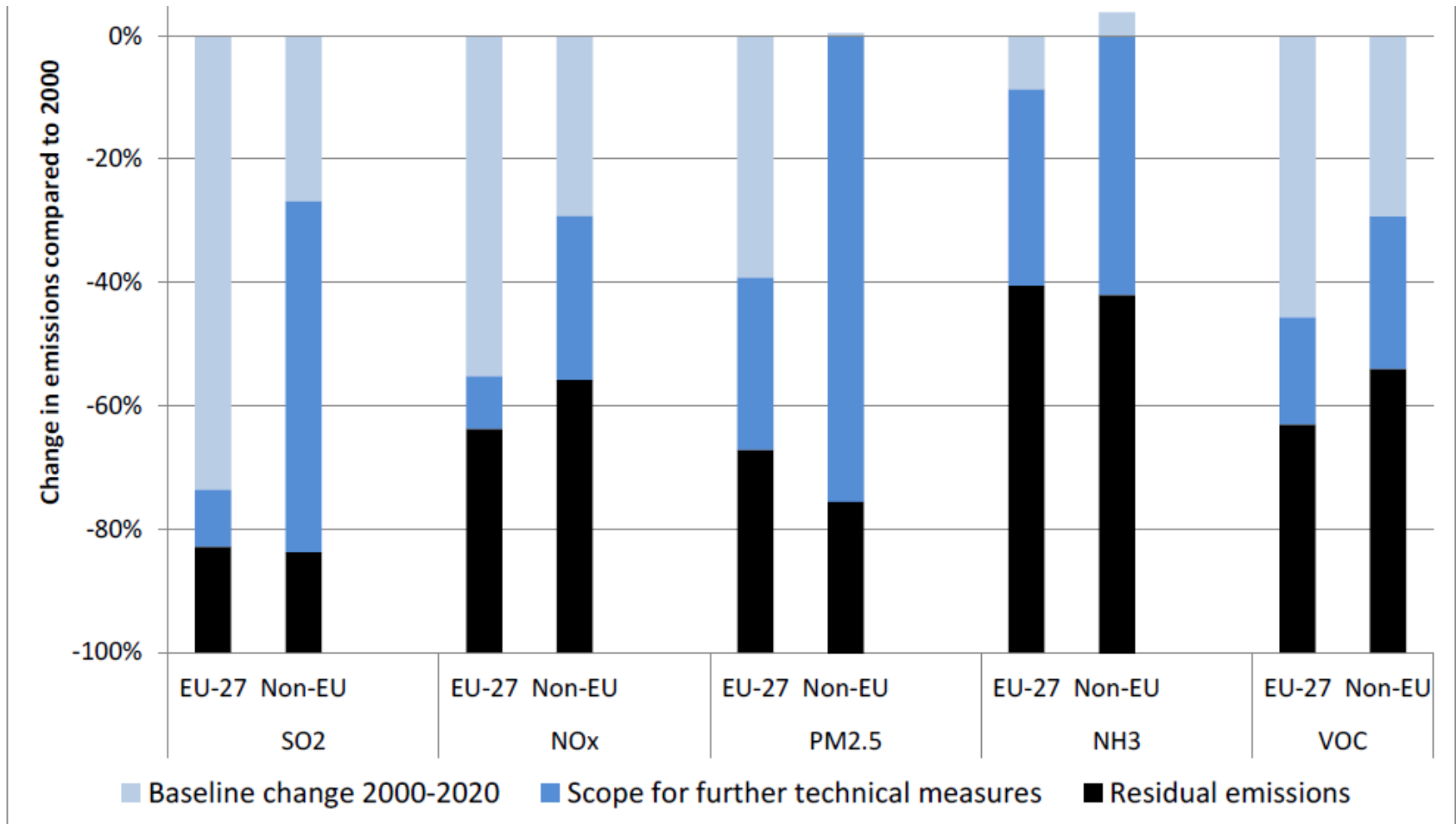
National

1. Ratification of LRTAP Protocols
2. Control on maintenance of Euro-6 vehicles
3. Scrapping of old vehicles/motorcycles
4. Enforcement (agricultural) emission regulation

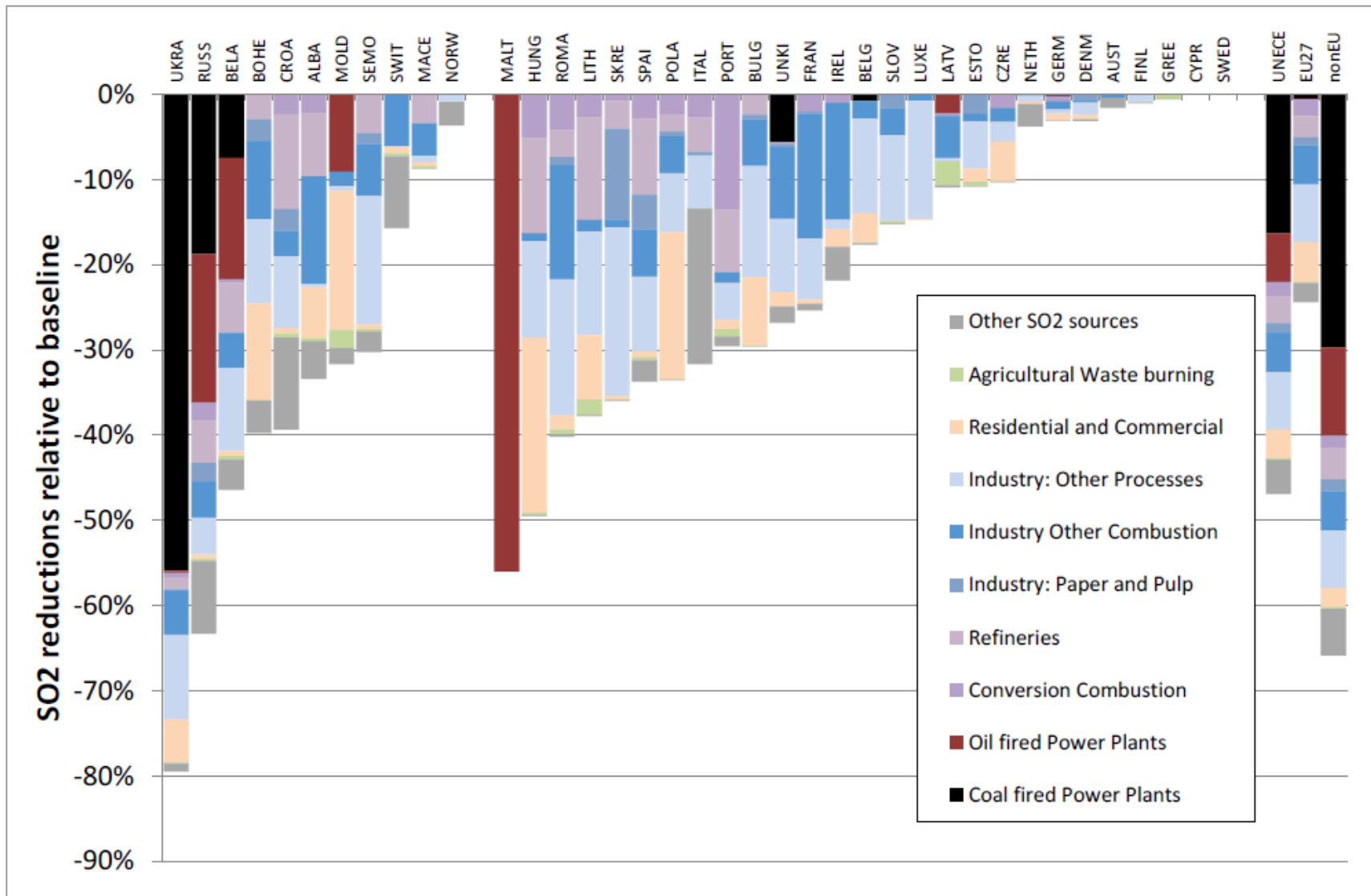
Cities

1. Low emission zones
2. Electric vehicles
3. Speed limits (highways)
4. Healthy city design
 - walking/cycling/public transport

Large reduction potential for SO₂ NO_x and PM_{2.5} in EECCA countries



SO₂ reduction options: mainly coal & oil fired power plants



What is hindering ratification by EECCA–countries?

- There are health benefits, but at a cost

Loss in life expectancy due to PM2.5 (2020)

	2000	BL	MTFR	COSTS	
EU-27	8.6	4.1	2.7	0.05%	11.500
Non-EU	7.7	6.0	2.2	0.21%	5.000
Total	8.3	4.7	2.6	0.07%	8.000

months % of GDP

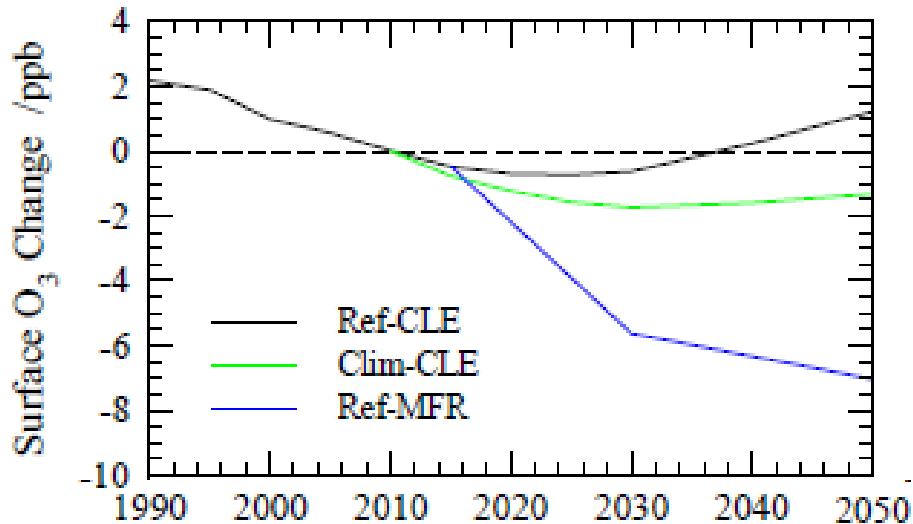
CIAM report to 48th WGSR - 2011

Average annual costs in € per life year gained

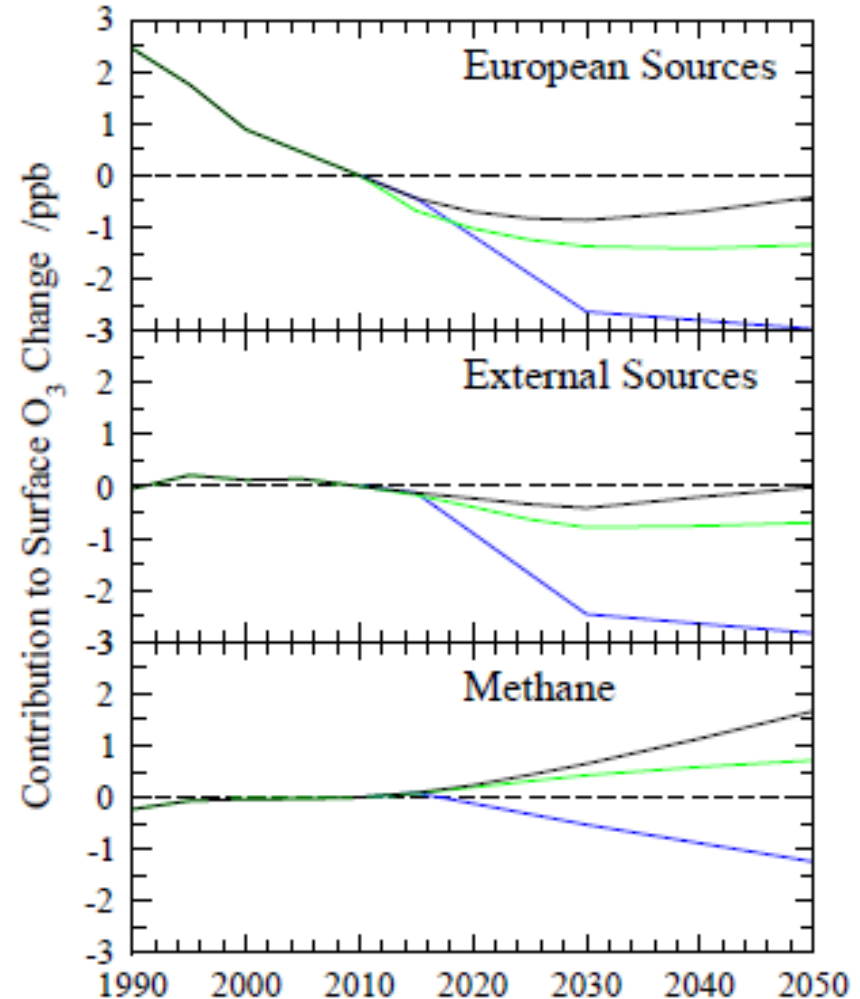
- Technical annexes would create a level-playing-field within UNECE
- National reduction obligations complex due to uncertain emission data

Ozone requires Northern Hemispheric cooperation, including methane abatement

European Surface O₃



Contributions to European O₃



Ozone background in Europe

Summer average ~ 42 ppb (33-50)

MTFR Europe -3 ppb

MTFR NH -3 ppb

MTFR CH4 -2 ppb

Possible priorities for solving knowlegde gaps

1. Improved emission data for EECCA-countries
2. Harmonized monitoring of air pollution policy implementation and effects on health and ecosystems
3. Explore synergies between energy, transport and public health at both local, national and regional scale
4. Explore synergies between agricultural policy, nature protection and public health
5. Explore cost-effective hemispheric strategies

Summary

1. International coordination remains necessary to further reduce background levels of PM and ozone, while guaranteeing a level playing field
2. Ammonia emission reduction will have transboundary impacts: reduced urban PM-exposure and biodiversity protection
3. Climate & energy measures together with additional end-of-pipe measures and cost-effective local actions on transport & domestic heating would enable meeting WHO-guideline values for PM_{2.5} in most parts in Europe
4. Effective ozone policy requires Northern Hemispheric cooperation that includes methane abatement

Acknowledgements

All networks: bodies under WGE, EMEP, AMAP, Task Forces, (inter)national monitoring
Individuals who contributed text, ideas, opinions, reviewers



Task Force on Health

ICP Integrated Monitoring



emep

ICP Materials

ICP Waters

ICP Modelling & Mapping



ICP Vegetation

AMAP

JEG Dynamic Modelling

NIVA

