

GAINS analyses of European air quality futures - State of play

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What information can we use to inform a review of the Gothenburg protocol?

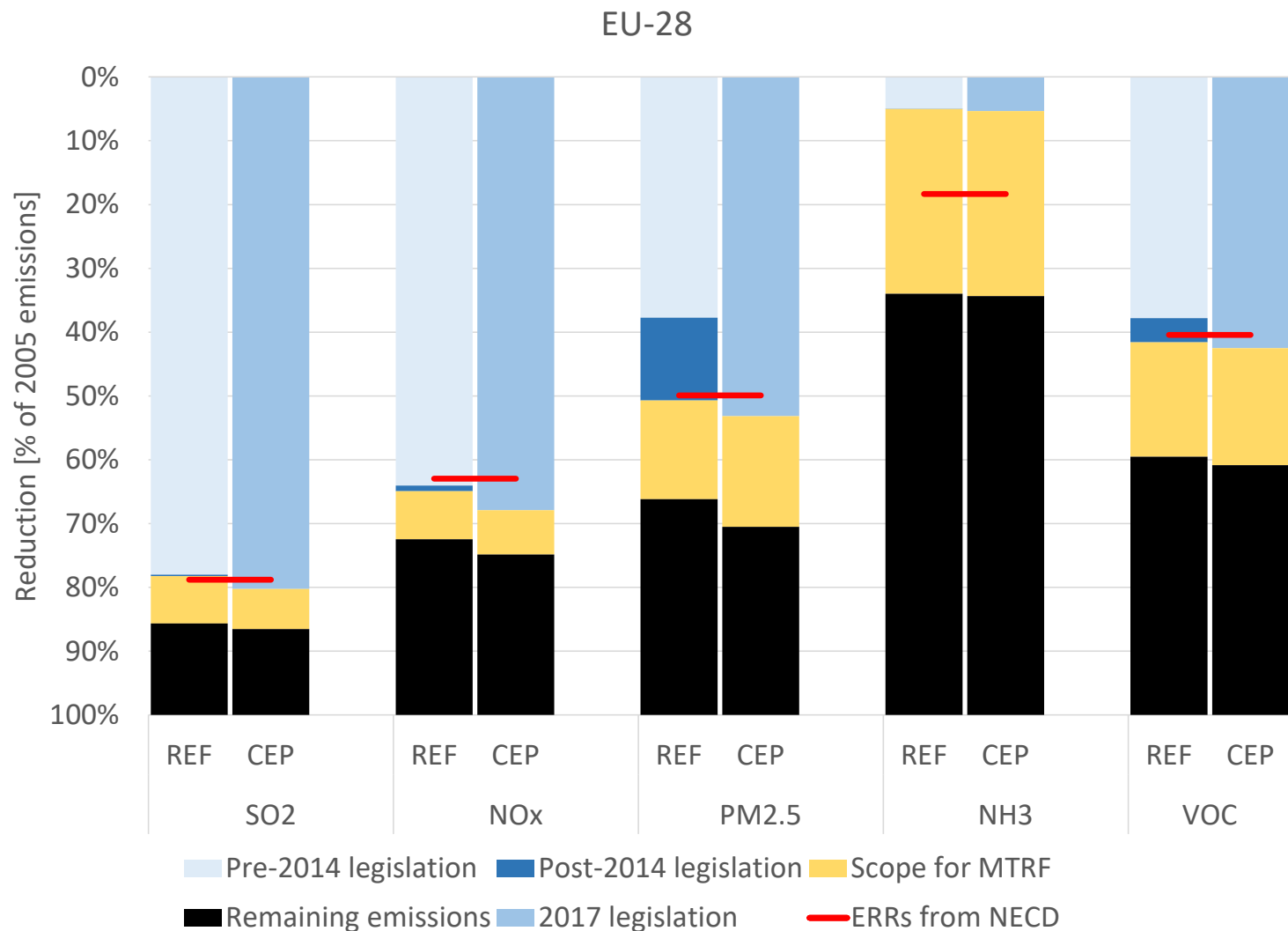
- 1st EU Clean Air Outlook 2017/2018
- EGTEI analyses for EECCA countries
- 2019 study on maritime emissions
- IEA World Energy Outlooks
- 2nd EU Clean Air Outlook 2020

The First Clean Air Outlook of the European Commission 2017

- Final NECD agreement
- Revised emission inventories
- New legislation after NECD
- Additional measures to reach for ERRs
- Interaction with EU climate policies

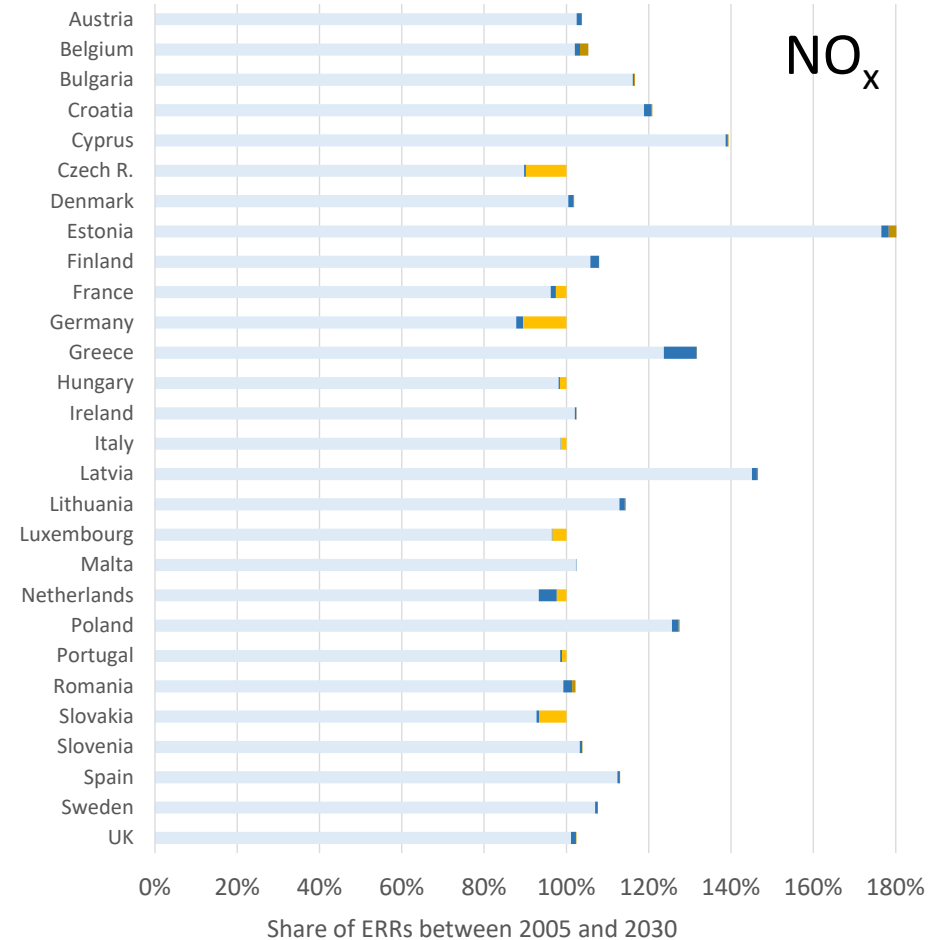
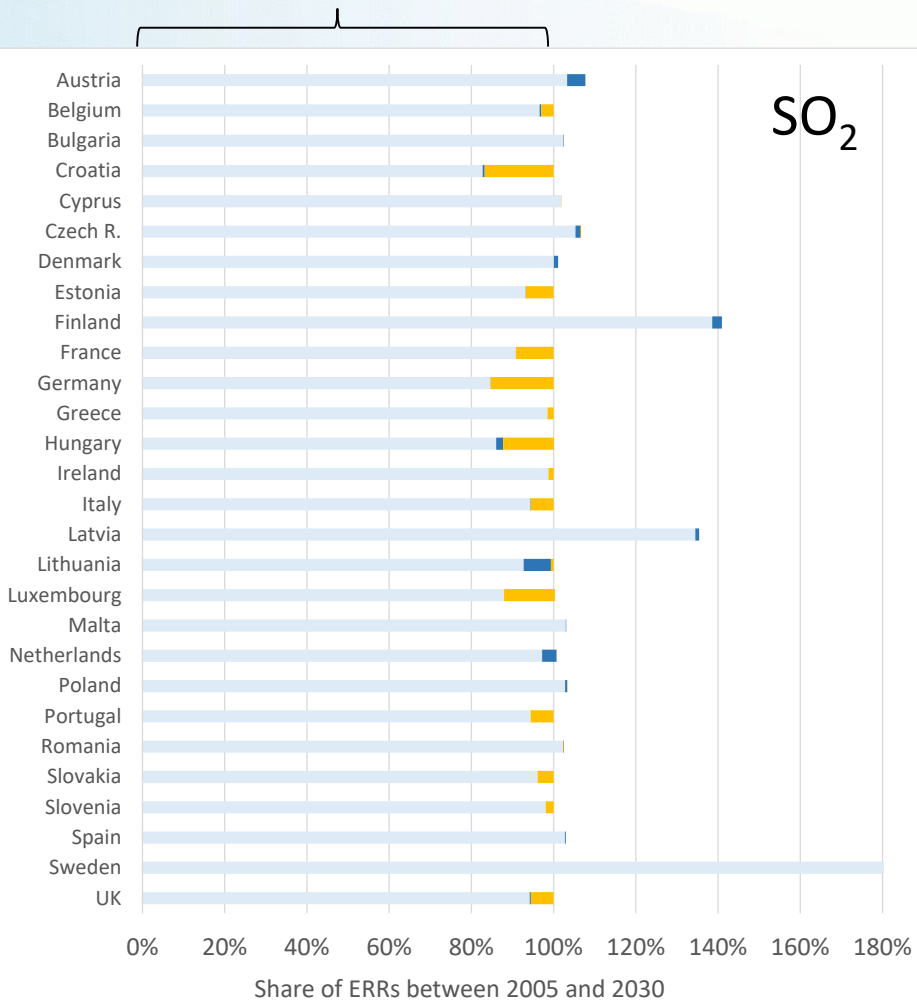
- Underlying baseline activity projection:
PRIMES 2016 REFERENCE scenario
(NEC analyses were based on PRIMES 2013 baseline)

Resulting baseline emission projections for 2030 and scope for further measures – EU-28



Additional efforts to meet the ERRs for the PRIMES 2016 REFERENCE scenario

The gap between 2005 and the ERRs

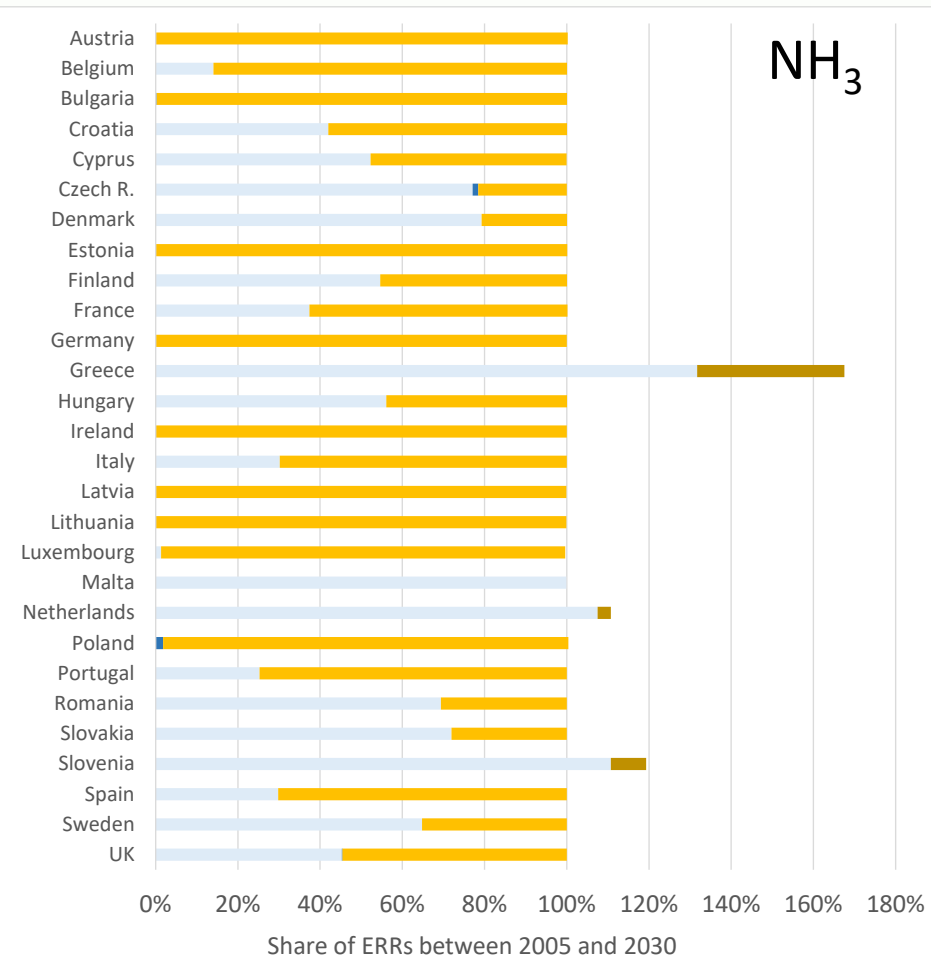
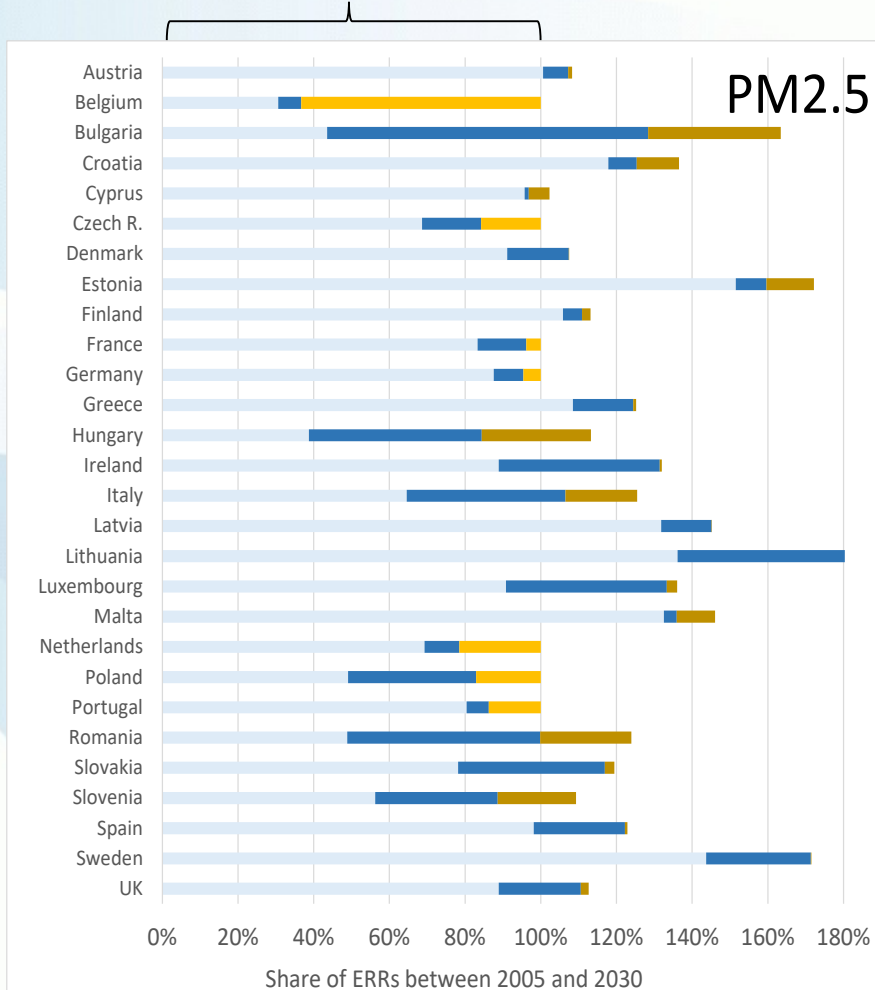


■ % delivered by pre-2014 legislation
 ■ % delivered by post-2014 legislation
■ Need for additional measures
 ■ Co-controls from other pollutants

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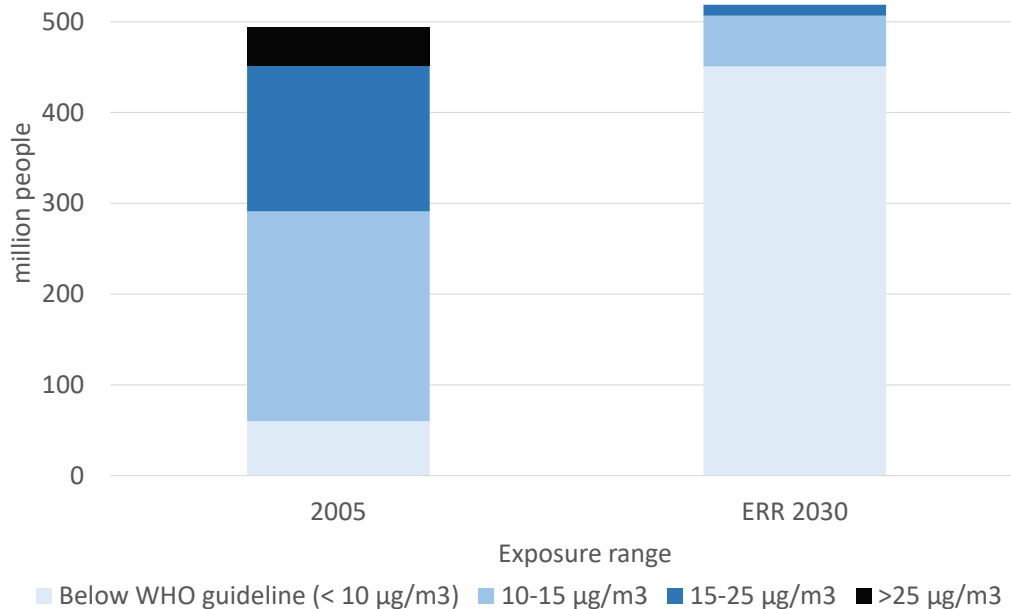
Air pollution emission control costs for meeting the ERRs

- For the PRIMES 2016 REFERENCE scenario:
 - 960 million €/yr (1.9€/person/year)

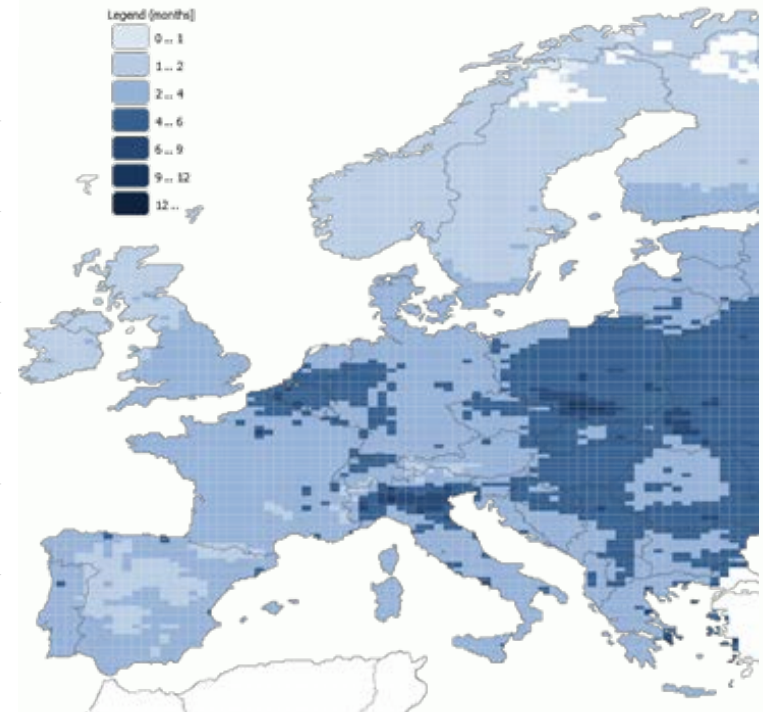
- For the CLIMATE AND ENERGY POLICY scenario
(12% lower consumption of fossil fuels,
40% less GHG emissions,
30% energy efficiency improvements):
 - 540 million €/yr (1.05€/person/year)

Ambient air quality – PM2.5

Distribution of population exposure to PM2.5 in the EU-28 - 2005 and 2030

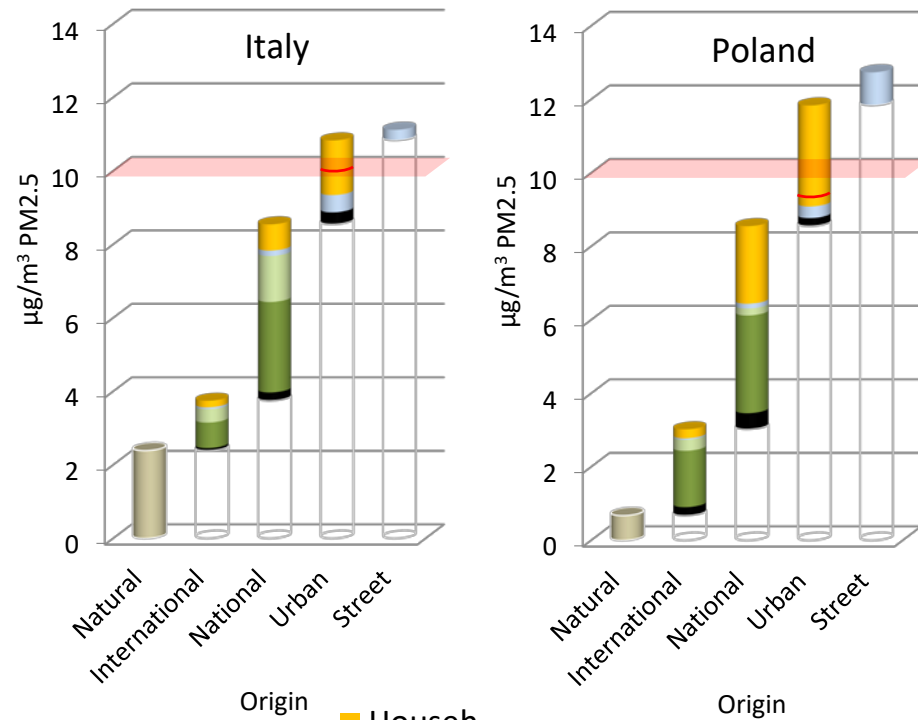


PM2.5 in 2030 ERR



In the overwhelming majority of countries PM2.5 will fall below the WHO guideline value of 10 µg/m³ – with the exception of Northern Italy and Southern Poland.

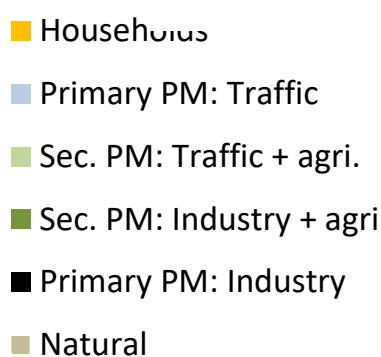
Remaining sources of PM2.5 - 2030 ERRs



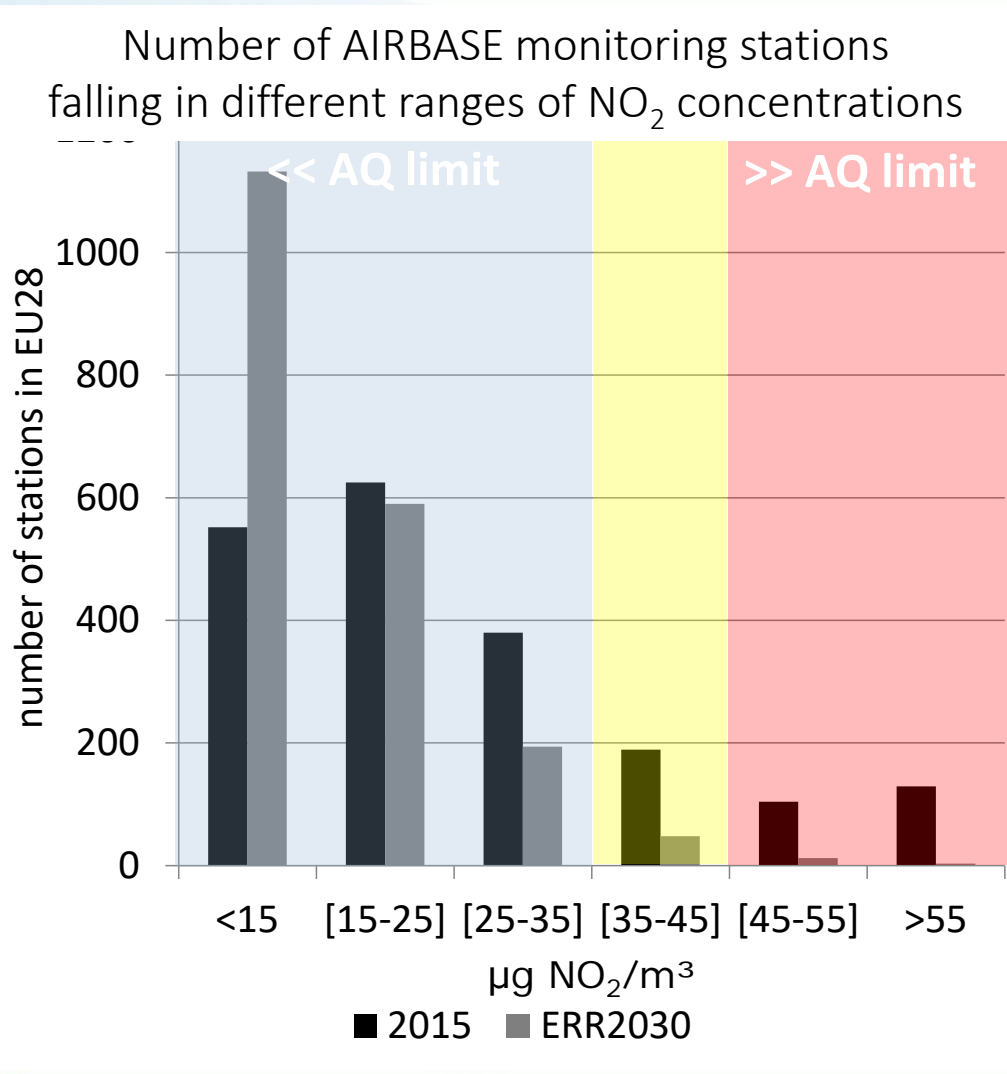
In Italy and Poland:

Main remaining contributors in 2030 after ERR measures:

- Secondary particles incl. NH_3
- Solid fuel stoves in households
- MTRF would eliminate almost all exceedances of WHO guideline



NO₂ exceedances




- While currently about 20% of the almost 2000 AIRBASE monitoring stations are robustly or possibly above the NO₂ limit value, that figure is almost eliminated with the ERRs

Biodiversity will remain under threat

- For biodiversity, the measures envisaged for reaching compliance with the ERRs will not achieve the improvements that have been suggested in the 2013 Commission proposal for the NEC Directive.
- Additional measures, especially for controlling NH₃ emissions, are available, and their application could further reduce excess nitrogen deposition by 75%. However, this would still leave 50% of the Natura2000 nature protection areas at risk.

EECCA countries



UNECE Convention on Long-Range Transboundary Air Pollution

**GAINS and other techno-economic tools
for post-processing of Gothenburg
scenarios in EECCA countries**

Modelling analysis performed by the GAINS_Europe Model

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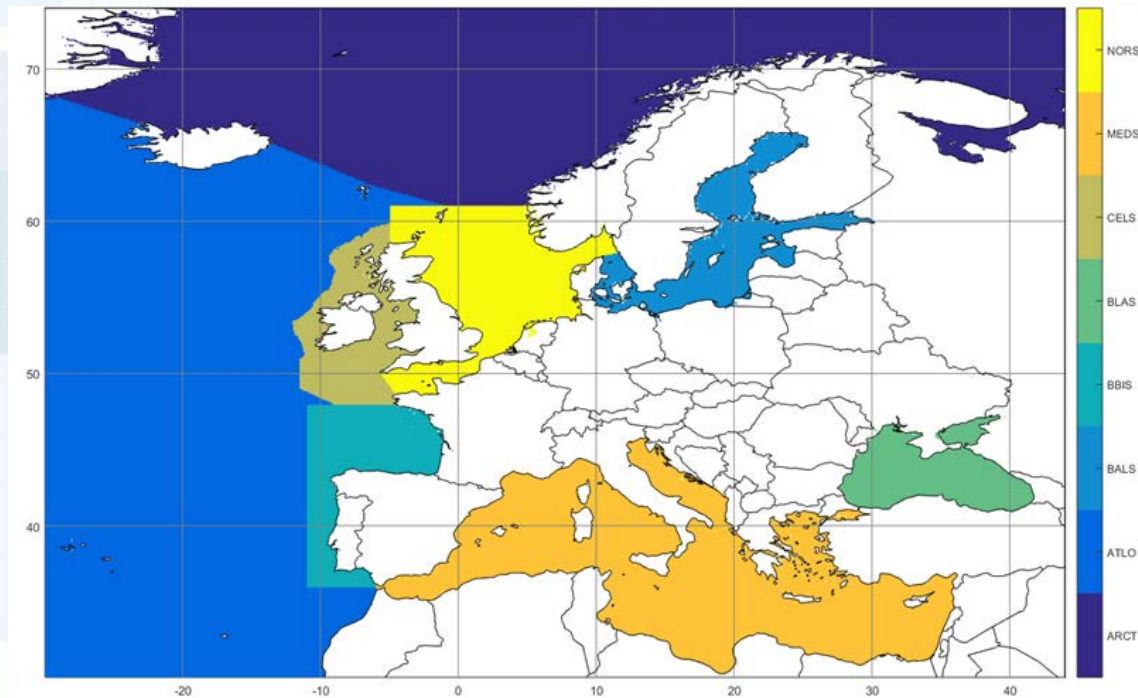
TFIAM 43rd Session, Helsinki, May 6-7, 2014

Conclusions:

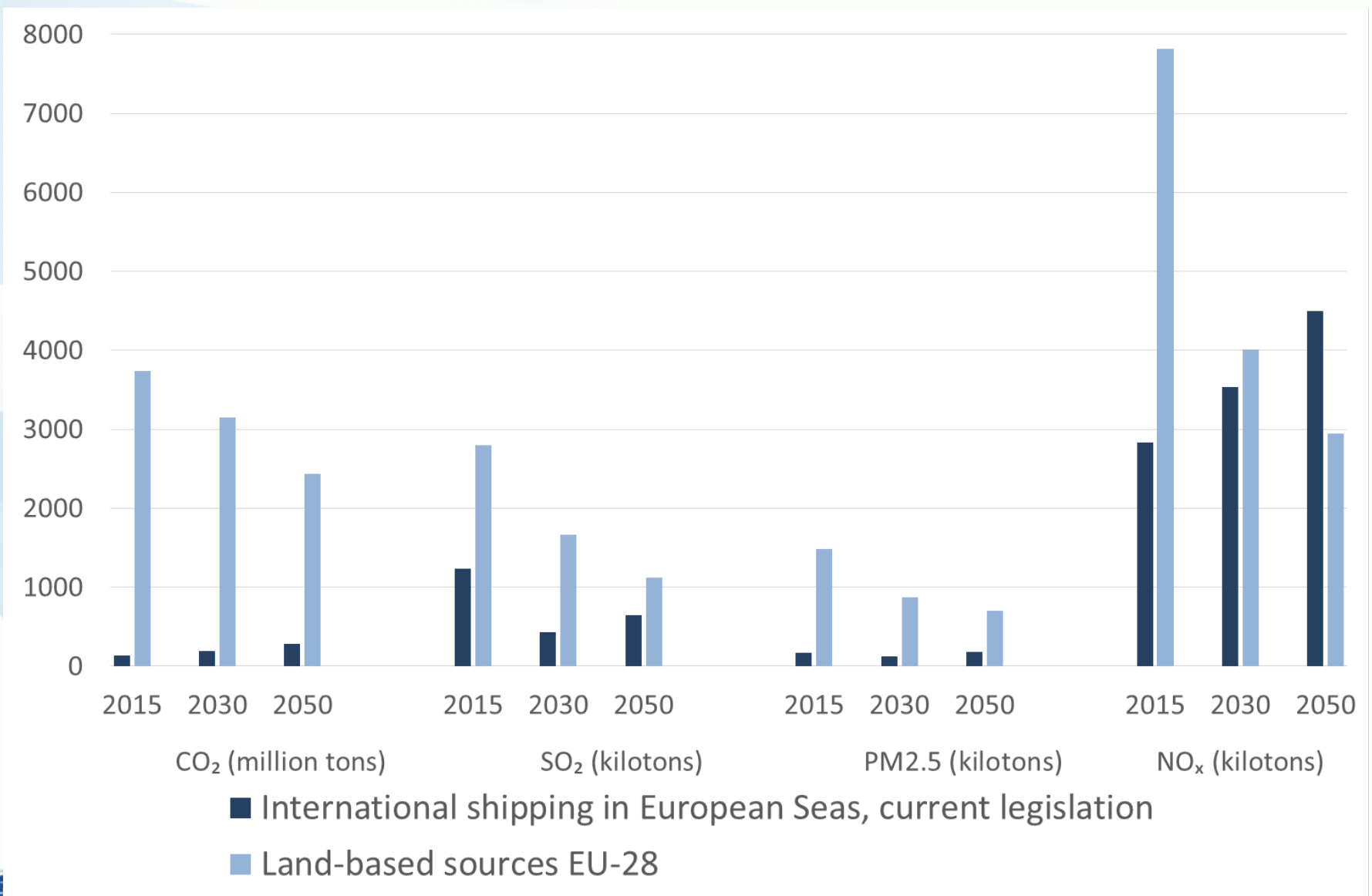
- ... From the calculations performed till now [for Russia and the Ukraine] it comes out that significant emission reductions may result from the implementation of technologies consistent with the ELVs in the Annexes of the revised Gothenburg Protocol.

Scenarios for other countries

- Baseline projections for all other countries (incl. North Africa) have been developed/updated for the 2019 IIASA study on 'Costs and benefits of reducing air pollution from shipping'
- Activity projections from the IEA World Energy Outlook 2018
- No bilateral consultations held



Emissions from international maritime shipping



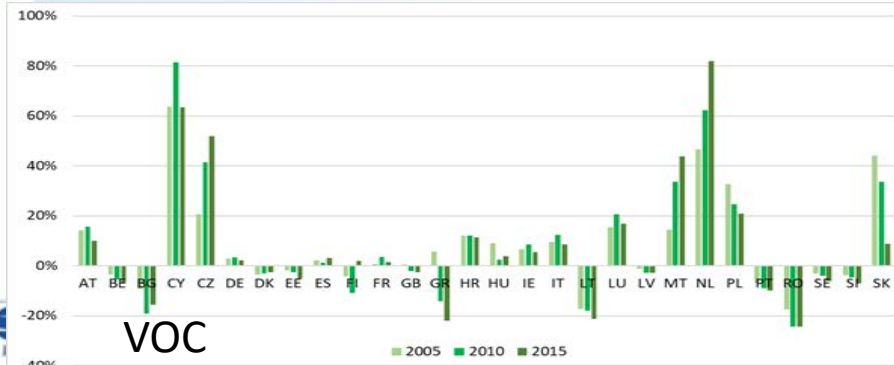
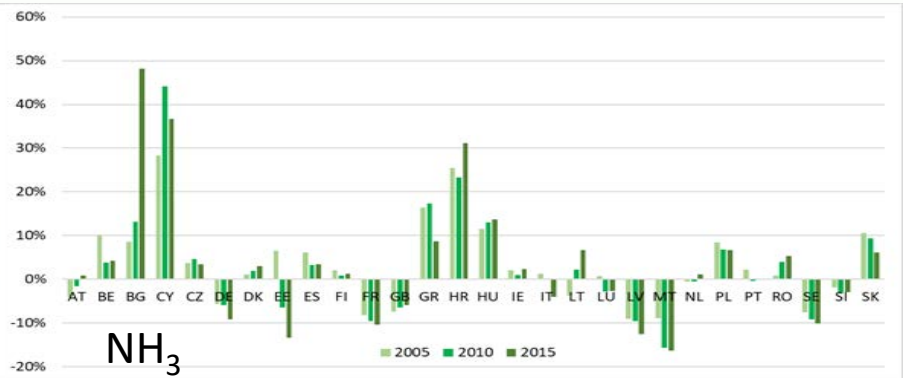
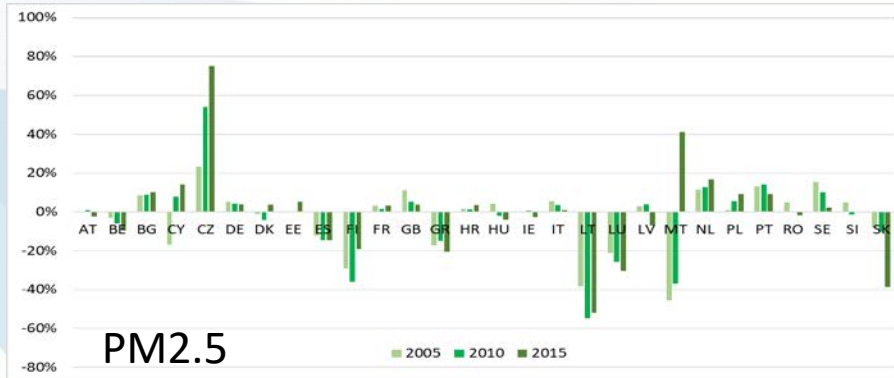
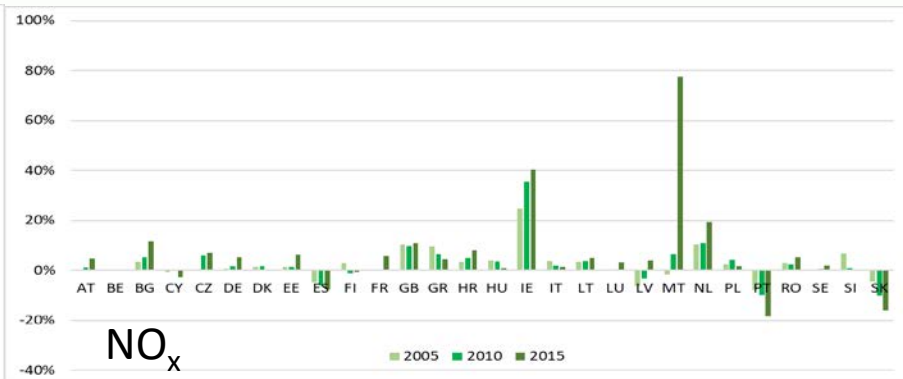
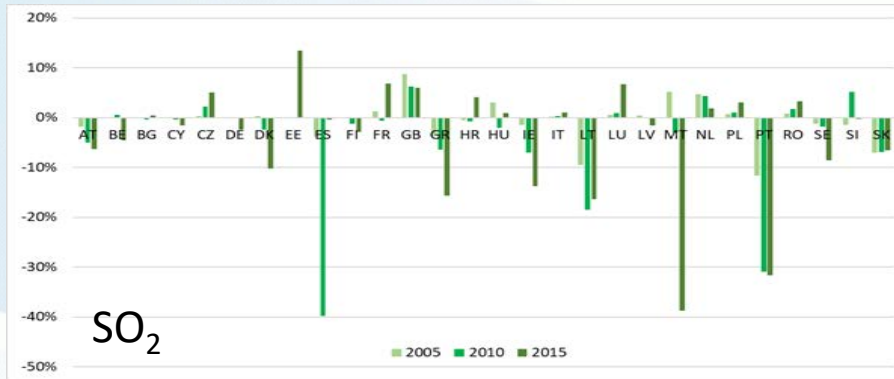
EU service contract for the 2nd Clean Air Outlook

IIASA/EMRC/UBA Vienna

Tasks:

1. Provide an up-to-date analytical framework
 2. Incorporate latest data on emission inventories
 3. Include new information provided by Member States in their first National Air Pollution Control Plans (NAPCPs) and draft National Energy and Climate Plans (NECPs)
 4. Develop scenarios to quantify
 - progress towards compliance with NEC Directive and towards the achievement of the objectives of the 7th Environmental Action Program,
 - related socio-economic impacts, and
 - further EU-level measures that would be needed to meet those objectives.
- Completion envisaged for summer 2020

Changes in reported emissions between the 2017 and the 2019 submissions



One third of all numbers changed by more than 10%

Activity scenarios

- NECD analyses 2013/2014:
 - PRIMES 2013 Reference scenario
- 1st Clean Air Outlook 2017/2018:
 - Baseline: PRIMES 2016 Reference scenario
 - Policy scenario: The CLIMATE AND ENERGY POLICY scenario (30% energy efficiency improvements, 12% lower consumption of fossil fuels, 40% less GHG emissions)
- 2nd Clean Air Outlook 2020:
 - Baseline: PRIMES 2016 Reference + 32.5% EU energy efficiency target + 32% EU renewable energy target
 - Policy scenarios: 2 scenarios of the EU 2050 climate strategy vision

Conclusions

- For the EU Member States,
 - the 1st Clean Air Outlook indicated that
 - ERRs for NH₃ and PM2.5 require further action in almost all MS; recent legislation will deliver the other ERRs in about half of the MS.
 - Costs for additional emission reductions range between € 960 and 540 million/yr (or € 1.9-1.05/person/year), depending on energy and climate policy decisions
 - The recent legislation will bring the WHO guidelines for PM2.5 within reach for most areas in 2030, while further efforts will be required at hot spots, especially for agriculture and residential combustion.
 - The 2nd Clean Air Outlook is under development
- For non-EU countries, data are available but need further analyses