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CIAM and Emissions Projections under the CLRTAP Convention

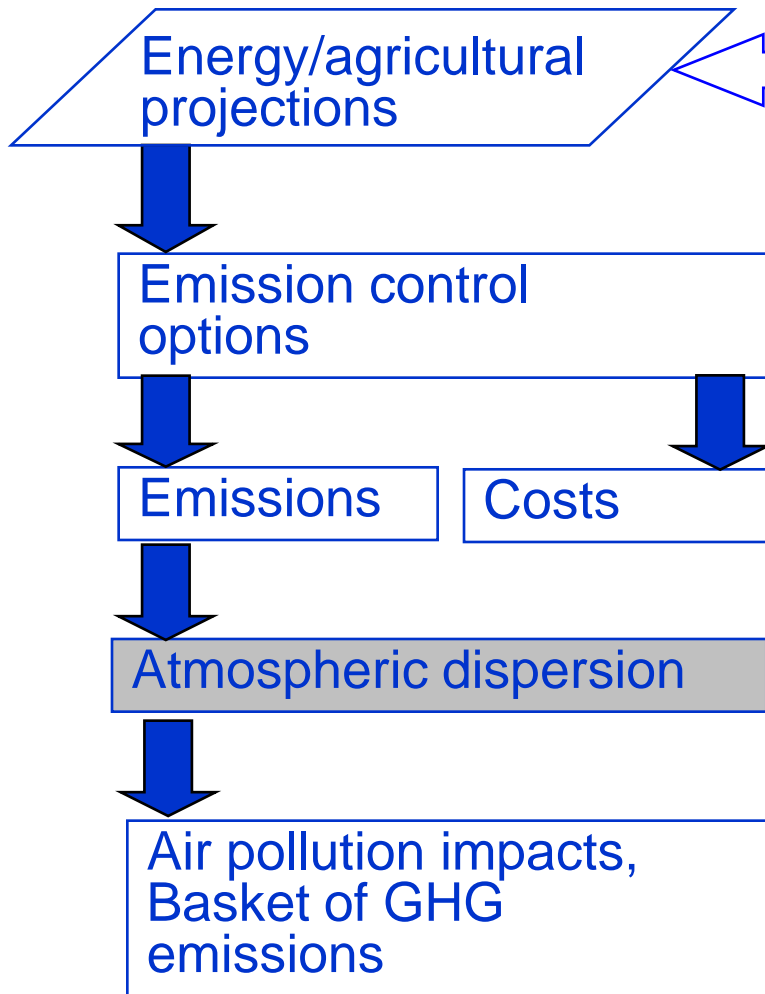
All calculations refer to Parties in the EMEP modelling domain

The GAINS multi-pollutant/ multi-effect framework



	PM	SO ₂	NO _x	VOC	NH ₃	CO ₂	CH ₄	N ₂ O	HFCs PFCs SF ₆
Health impacts: PM	✓	✓	✓	✓	✓				
O ₃			✓	✓			✓		
Vegetation damage: O ₃			✓	✓			✓		
Acidification		✓	✓		✓				
Eutrophication			✓		✓				
Radiative forcing: - direct						✓	✓	✓	✓
- via aerosols	✓	✓	✓	✓	✓				
- via OH			✓	✓			✓		

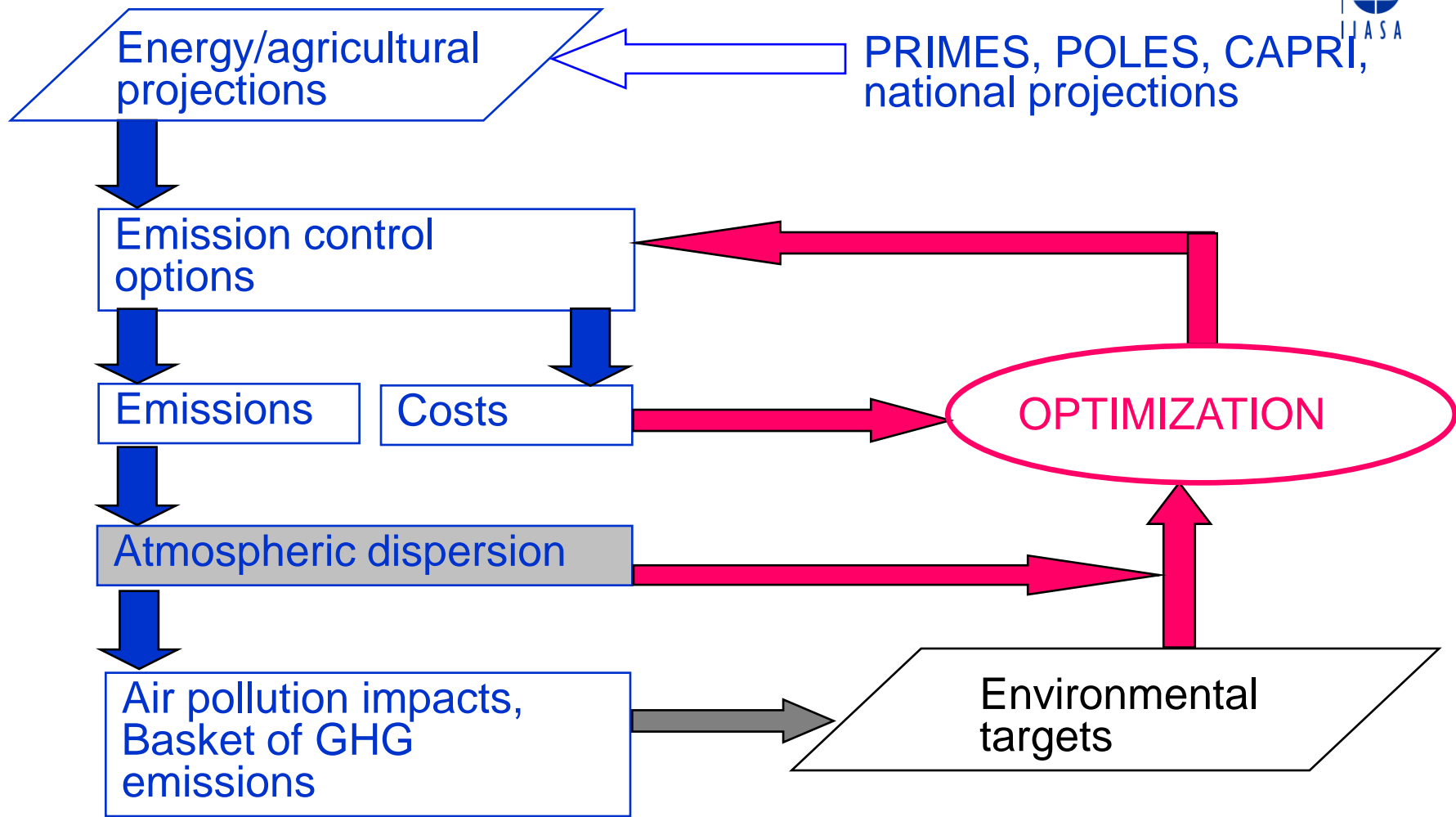
Building blocks of GAINS



PRIMES, POLES, CAPRI,
national projections

Simulation/
“Scenario analysis”
mode

The GAINS optimization mode



Baseline assumptions: Activity projections



EU-27:

- PRIMES energy projection that meets the targets of the EU Climate and Energy Package (20% reduction of GHG, 20% improvement in energy efficiency, 20 % share of renewable energy)
- National agricultural projections submitted to CIAM

Other Parties:

- Latest projections available at CIAM
 - National energy projections supplied by Norway, Switzerland (2006), Russia (2002), Ukraine (2004)
 - 1996 energy projection used for Gothenburg Protocol for Albania, Belarus, Bosnia-H., Croatia, Moldova, TFYROM, Serbia-M.
 - National (or FAO) agricultural projections

Baseline assumptions: Emission control measures



EU-27:

- “Current policy” case, as in NEC Report #6:
 - Current national legislation
 - Commission proposals on Euro-VI and IPPC revision
 - Additional measures to meet 2010 NECs in 2020

Norway and Switzerland:

- Current national legislation

Other Parties:

- Controls only for PM from stationary sources

MRR case

“Maximum reductions included in RAINS”



MRR assumes:

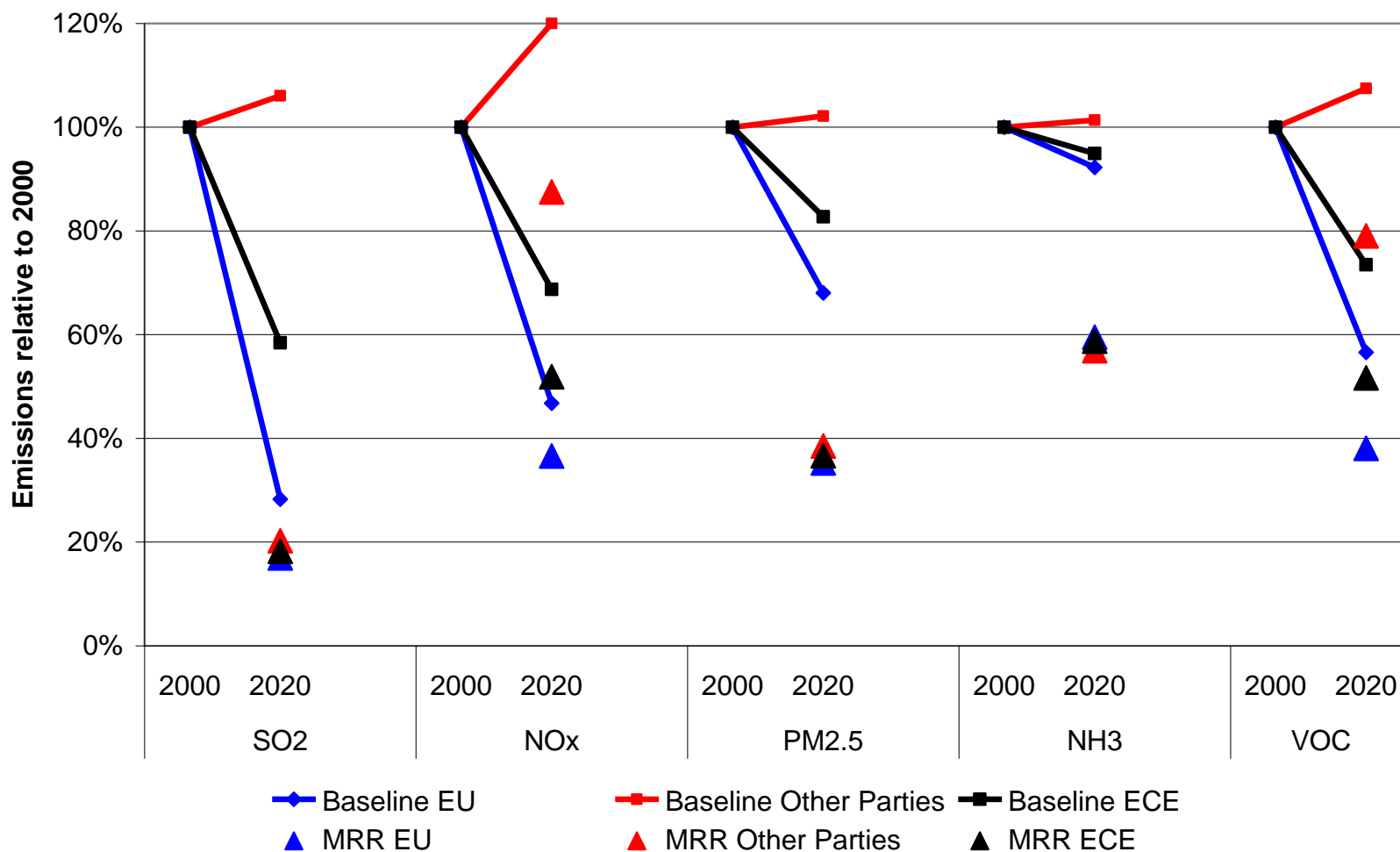
- Full implementation of all technical end-of-pipe emission controls that are considered in RAINS
- Respecting natural turnover of capital stock, i.e., no pre-mature scrapping of existing installations

MRR does not consider potentials from:

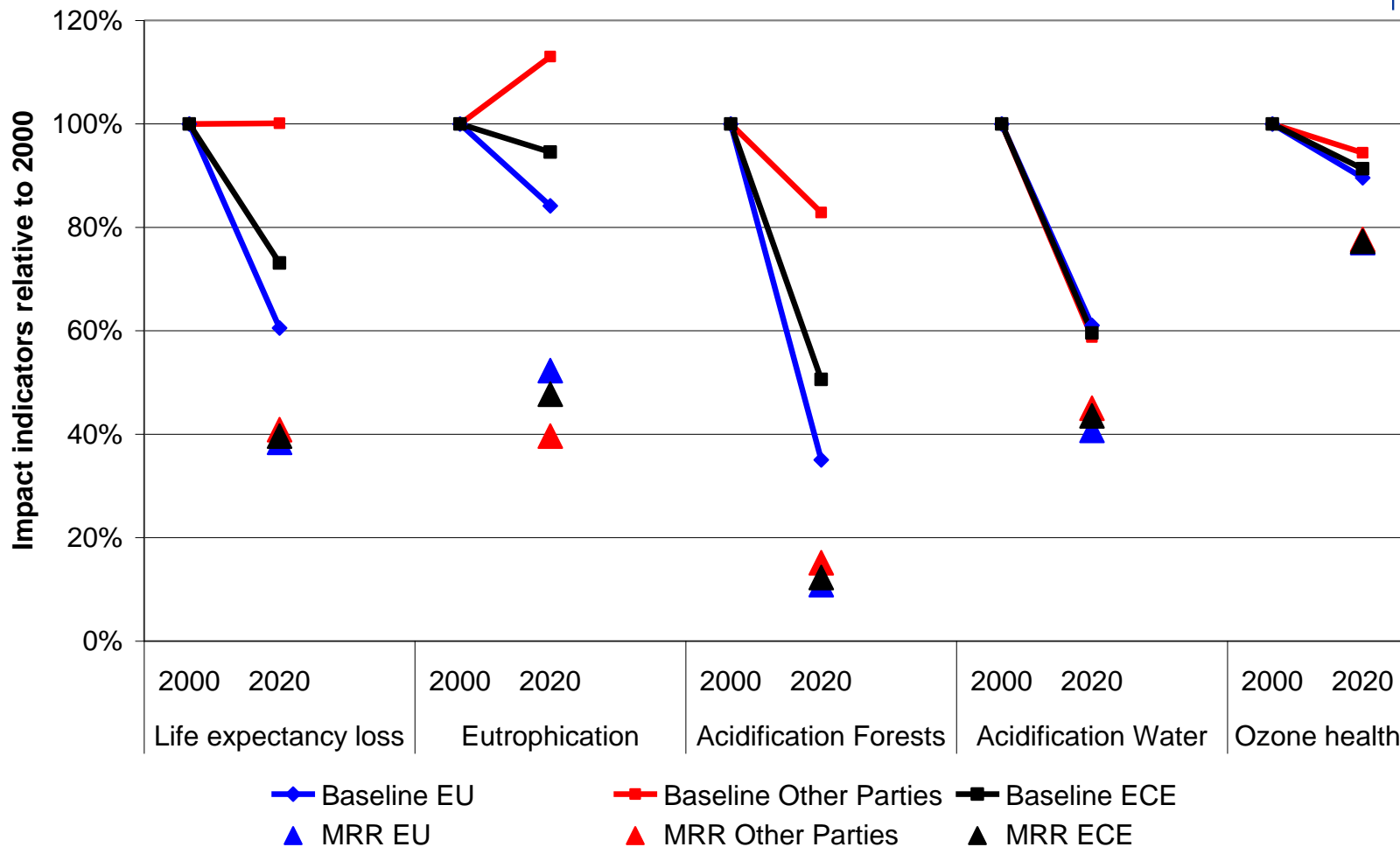
- Energy efficiency improvements^{*)}
- Fuel substitution^{*)}
- Behavioural changes
- Lower demand for energy services

^{*)} these are considered in GAINS

Baseline and MRR emissions relative to 2000



Baseline and MRR impact indicators relative to 2000

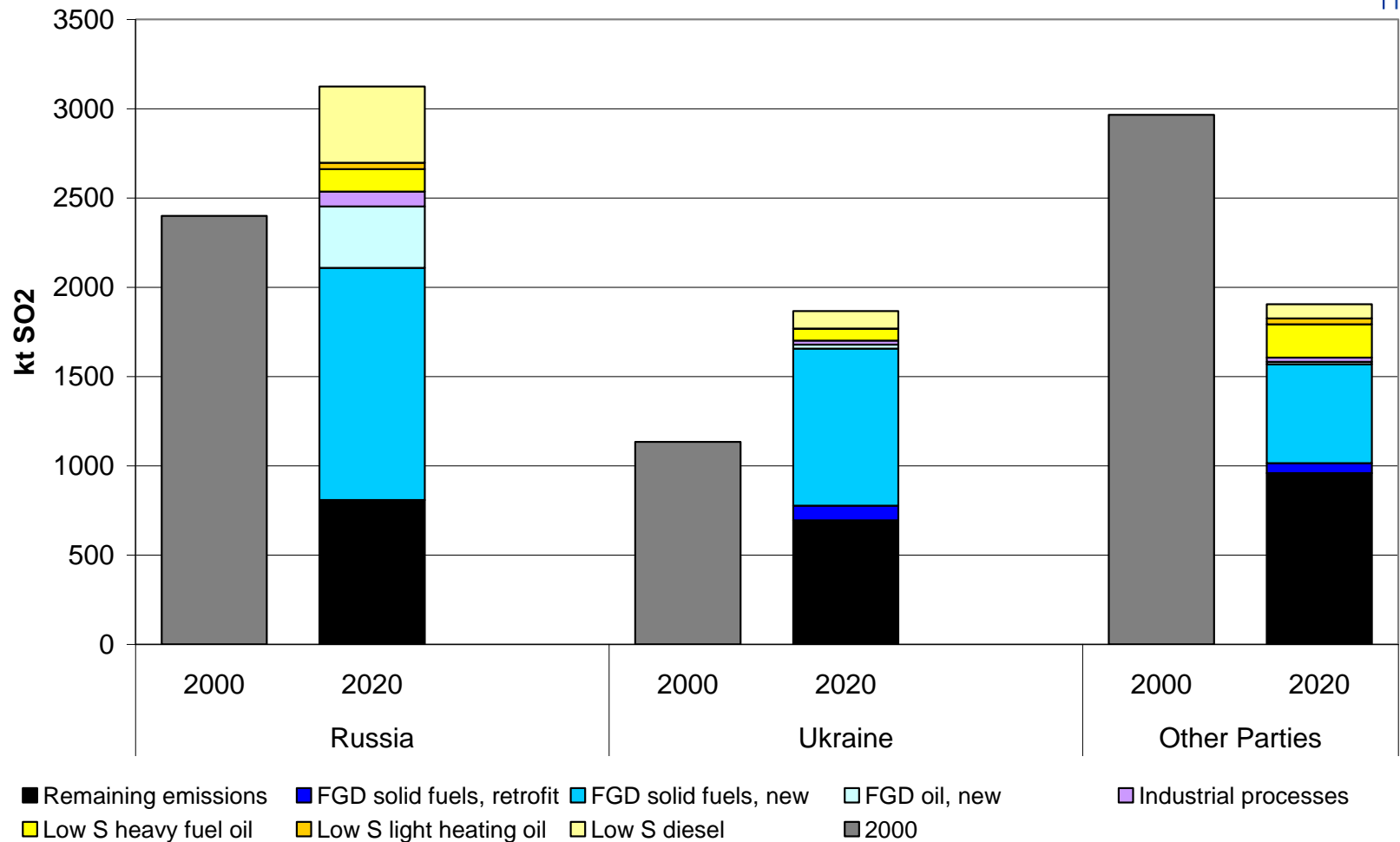


Analysis for non-EU countries that have not ratified the Gothenburg Protocol



- “With measures” scenario:
 - FGD for new and retrofit of 50% of old plants in 2020
 - Low sulphur fuels (1% heavy fuel oil, 0.1% light fuel oil, 0.05% diesel)
 - Industrial processes: -50% SO_2 , -40% NO_x , PM emission standards as currently in force for new Member States
 - Primary NO_x measures for boilers
 - Euro 4/IV for road vehicles
 - Improved electrostatic precipitators for large boilers

Emission control potentials for SO₂



Potentials of major control measures Non-EU parties (compared to 2020 baseline projection)

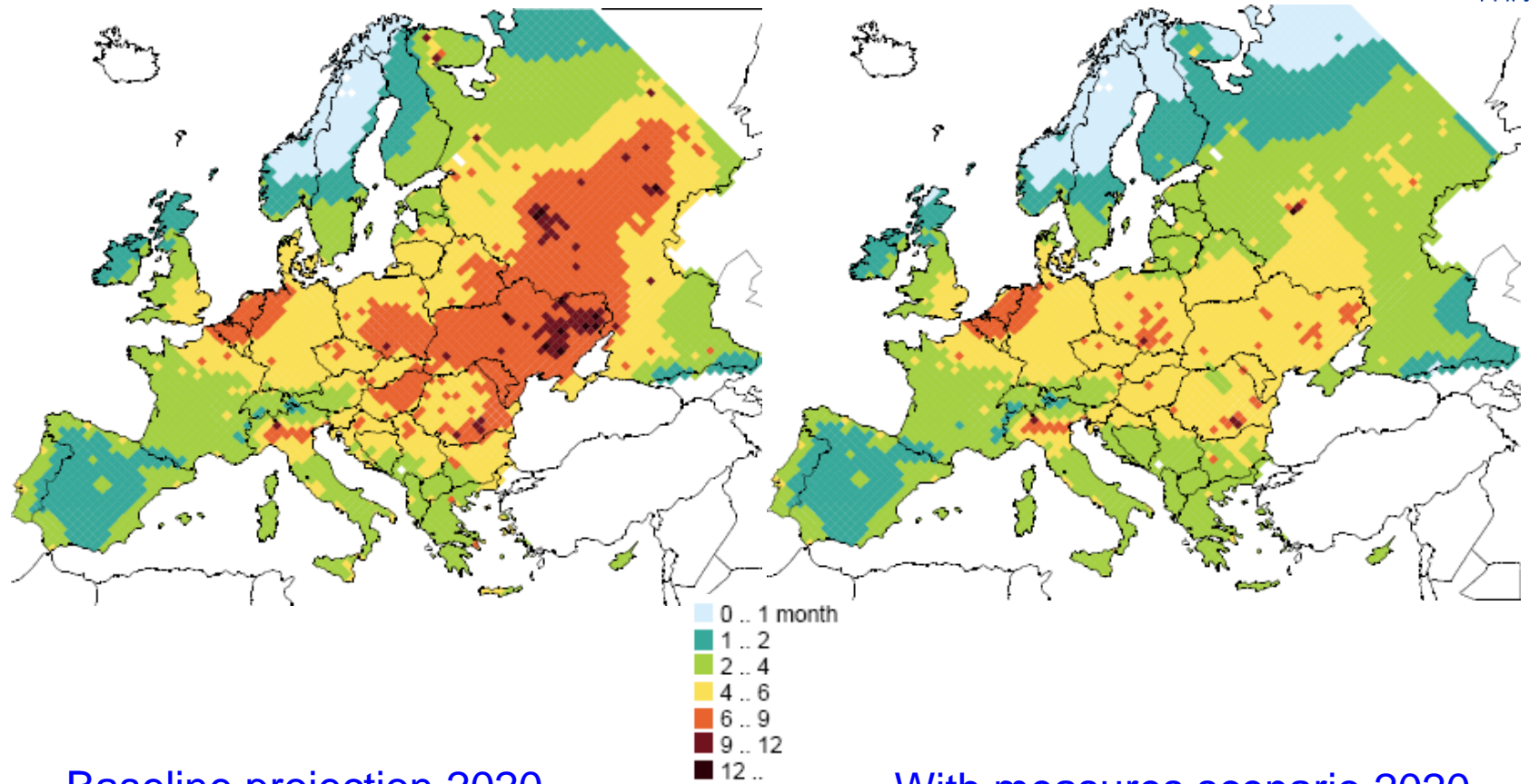


- FGD for new plants: -40% SO₂
- 0.05% S diesel: -10% SO₂

- Euro-4 for passenger cars: -13% NO_x, -2% PM2.5
- Euro-IV for heavy duty vehicles: -8% NO_x, -4% PM2.5

- Stricter PM emission limit values for boilers: -16% PM2.5

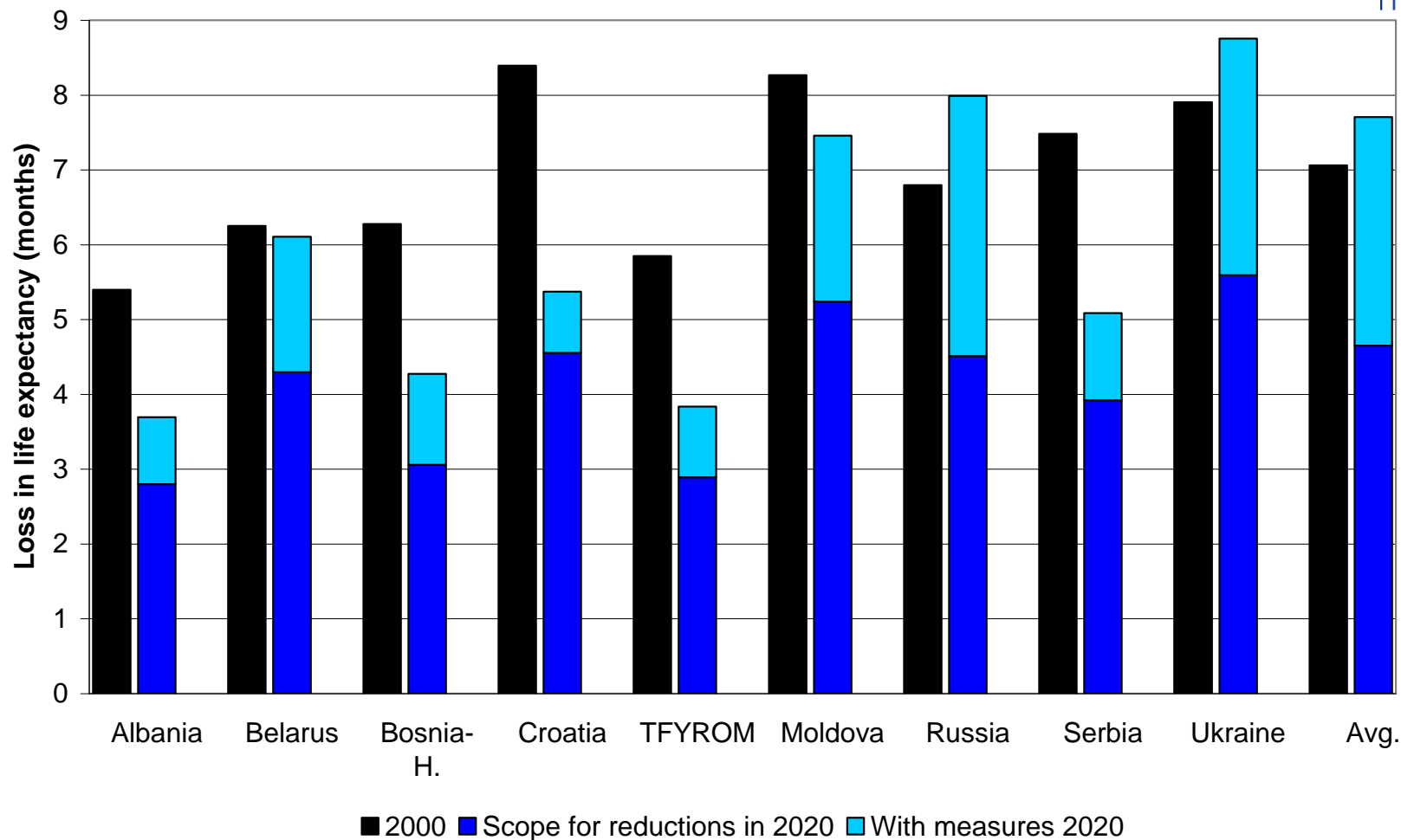
Loss in statistical life expectancy due to anthropogenic PM2.5 (months)



Baseline projection 2020

With measures scenario 2020

Loss in statistical life expectancy due to anthropogenic PM2.5



Conclusions



- Baseline emissions are expected to
 - decline in the EU countries
 - show no clear trends in the other countries
- Further improvements are technically feasible
- Cost-effectiveness analysis require guidance from negotiating Parties about shared key assumptions on
 - Desired improvement level
 - Baseline activity pathways (current pathways for non-EU countries received only limited review)
 - Baseline emission control legislation (assumptions for EECCA countries rather conservative)
 - Impacts of policies in other areas (climate, agriculture, energy security, etc.)
 - Background emissions (international shipping, countries who are not members to the Convention)