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Scope for further environmental improvements in 2020
beyond baseline projections

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Contents

- Scope for emission reductions
- Scope for environmental improvements
- Target setting approaches
- Conclusions
- Questions

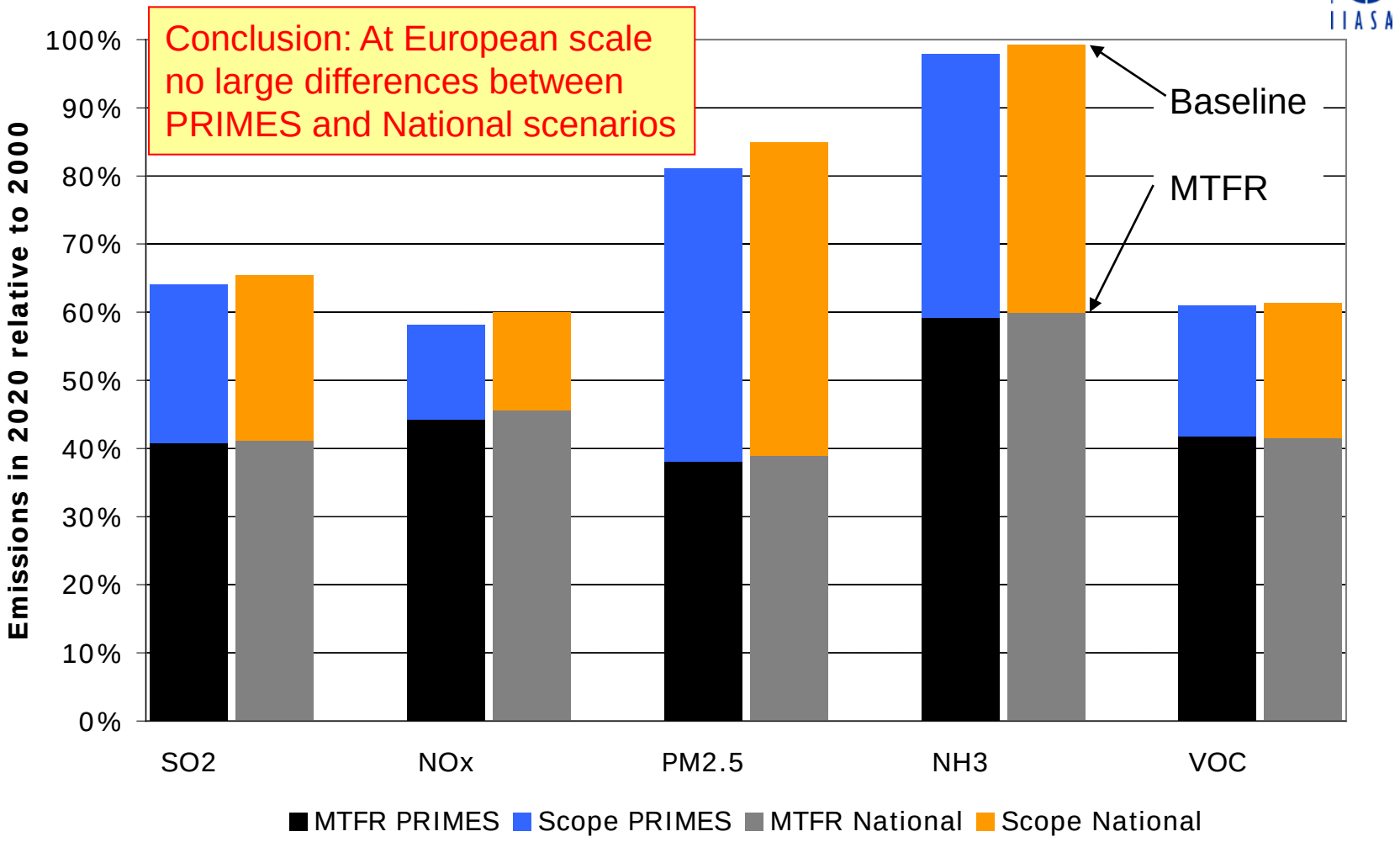
Assumptions and caveats

- Baselines have slightly changed after February meeting in response to country comments
- Calculations without urban increments
  (as 'City-Deltas' are not yet available for non-EU countries)
  - Thus results are not directly comparable with EU NEC calculations!
- Ecosystems-specific deposition for eutrophication, CL data of 2008
- YOLLs based on actual population numbers for 2000 and 2020
- 'IMO57 light' for ships
- Comparison to 2000 based on EUROSTAT/PRIMES activity statistics
- Costs are reported in € of 2005
  - Note that in NEC reports costs were given in € of 2000

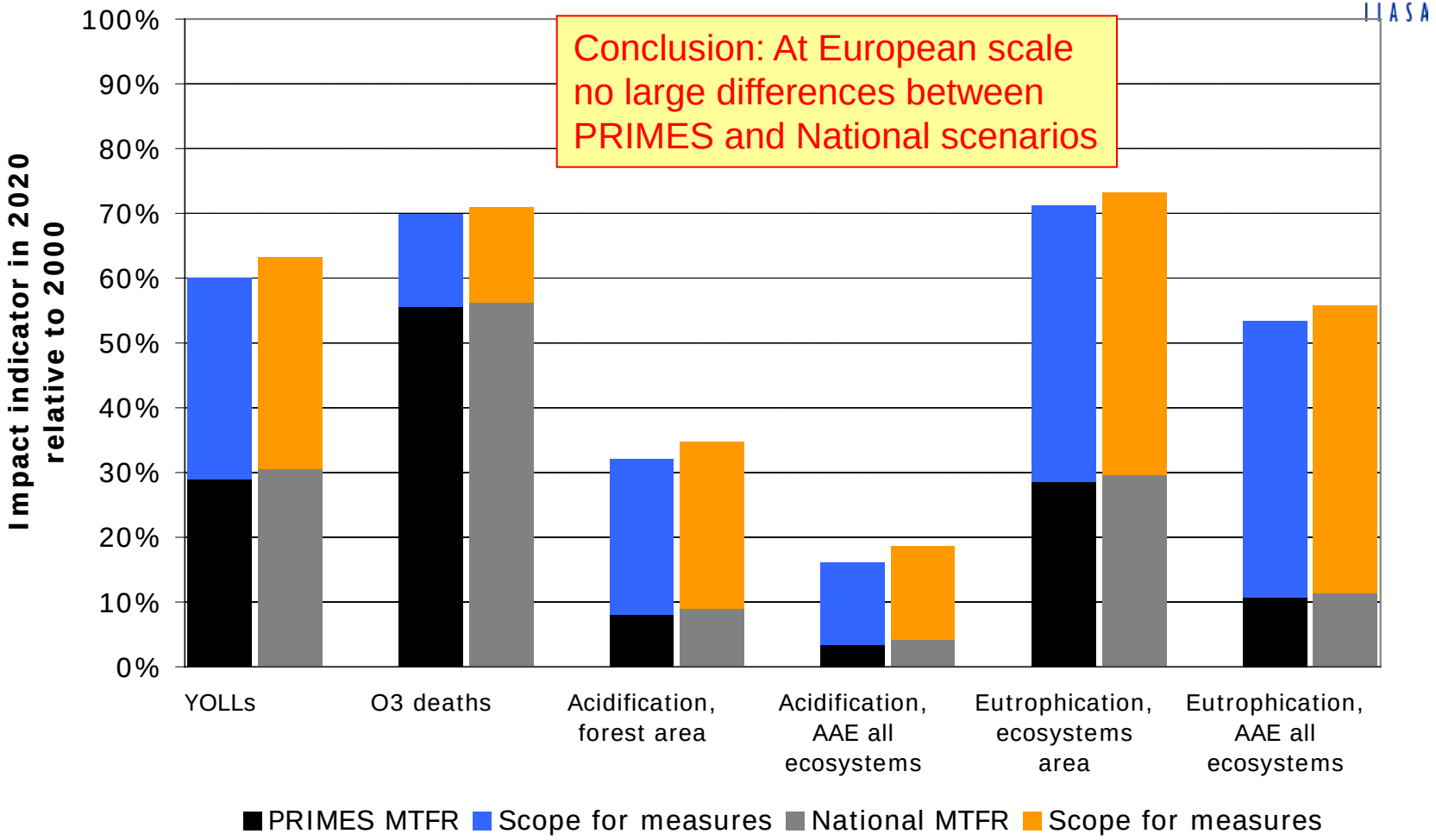
Sources of activity projections

	PRIMES 2009 scenario	National 2009 scenario
Energy projections		
PRIMES 2009 baseline	EU-27, MK	
National projections		AT, CR, CZ, DK, FI, GR, IE, IT, NL, NO, PT, ES, SE, CH, UK
PRIMES 2008 C&E	CH, NO	BE, BG, CY, EE, FR, DE, HU, MK, LV, LT, LU, MT, PL, RO, SK, SI
IEA WEO 2009	AL, BY, BA, CR, MD, RU, RS, UA	AL, BY, BA, MD, RU, RS, UA
Agriculture		
CAPRI 2009	EU-27, AL, BA, CR, MK, NO, RS	AL, BA, BG, CY, CZ, DK, EE, FR, DE, GR, HU, LV, LT, LU, MK, MT, NO, PL, PT, RS, SL
National projections	CH	AT, BE, CR, FI, IE, IT, NL, RO, SK, ES, SE, CH, UK
FAO 2003	BY, MD, RU, UA	BY, MD, RU, UA

Scope for further emission reductions



Scope for further environmental improvements



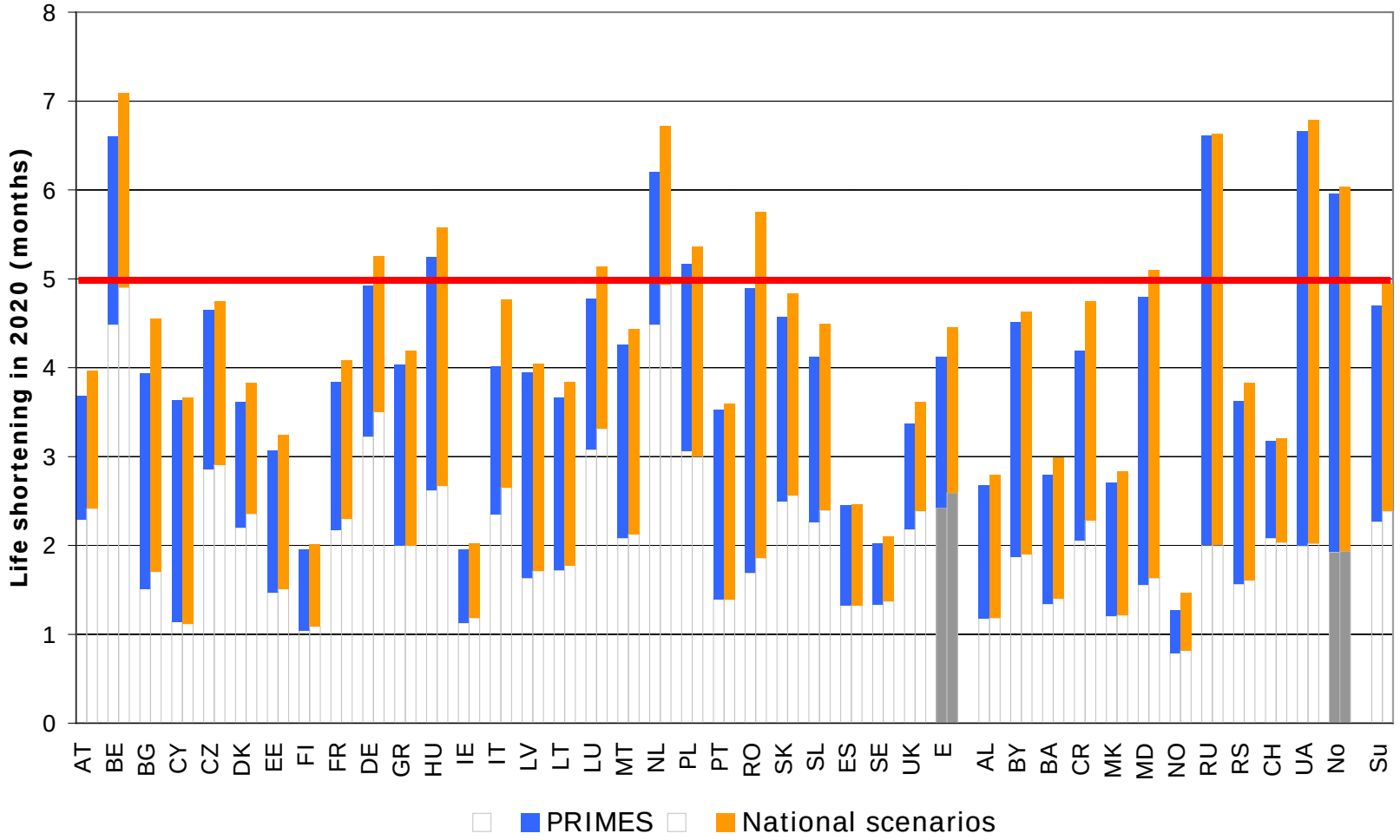
Options for target setting
for a cost-effectiveness optimization

- Targets
  - must be achievable in all countries
  - should result in internationally balanced costs and benefits

- Option 1: Uniform absolute targets (‘caps’) on environmental quality (in terms of impact indicators)

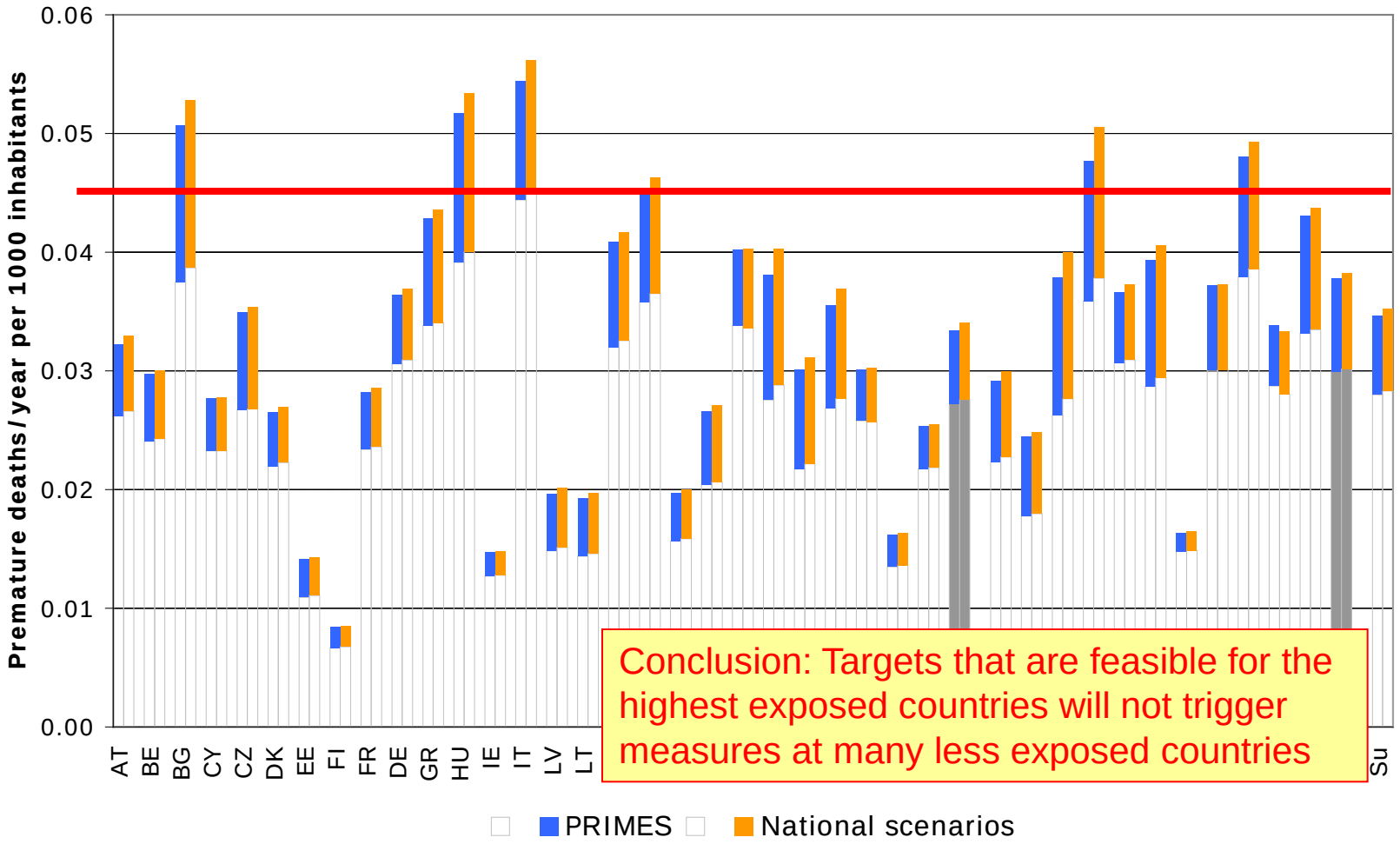
Option 1: Uniform cap

Loss in statistical life expectancy from PM2.5 (months)



Option 1: Uniform cap

Premature mortality rate from O_3 (cases/1000 people/year)



Options for target setting for a cost-effectiveness optimization

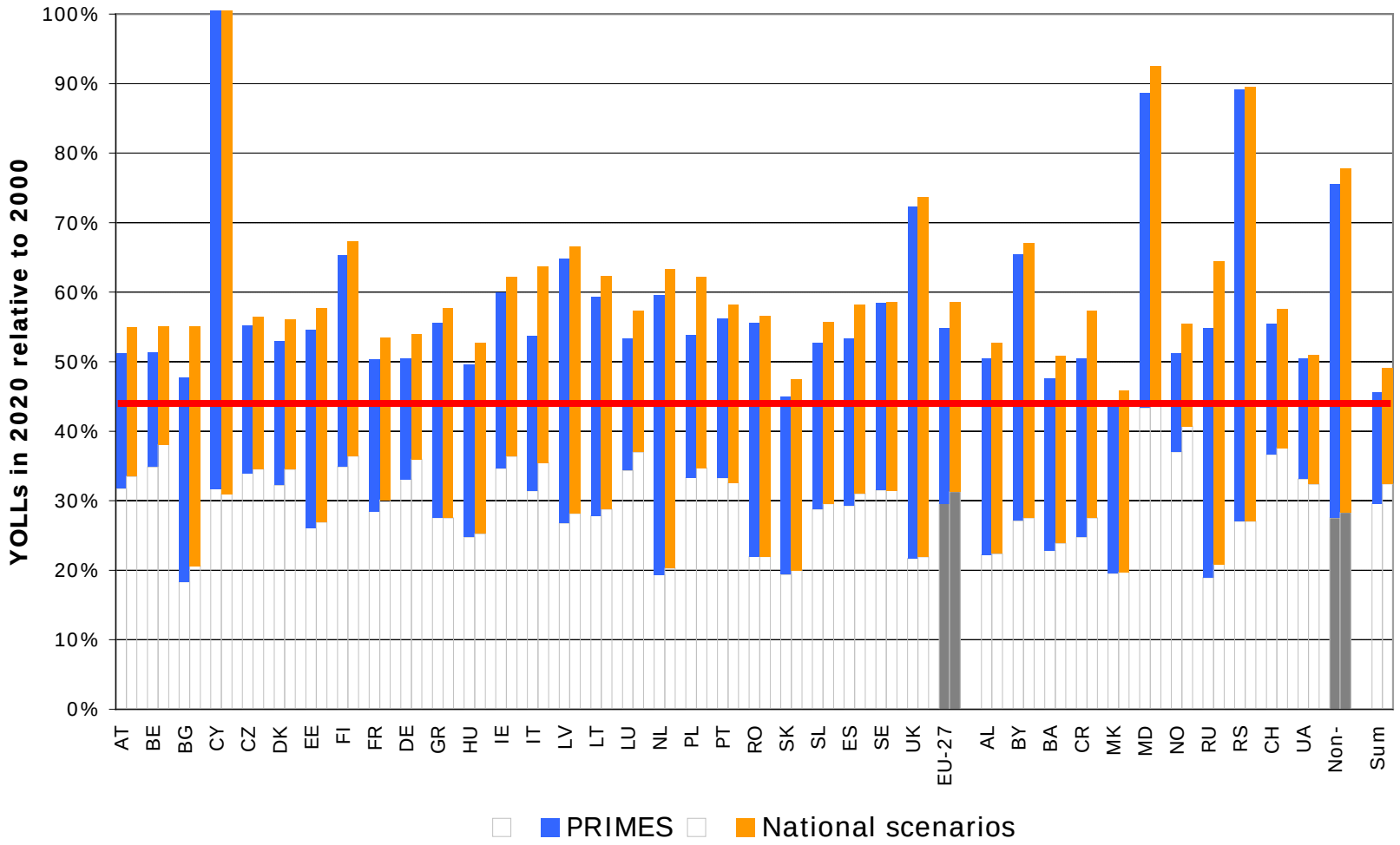
- Targets
  - must be achievable in all countries
  - should result in internationally balanced costs and benefits

- Option 1: Uniform absolute targets (‘caps’) on environmental quality (in terms of impact indicators)

- Option 2: Equal relative change (‘gap closure’) in impact indicators *compared to a base year* (e.g., 2000)

Option 2: Equal relative improvements compared to 2000

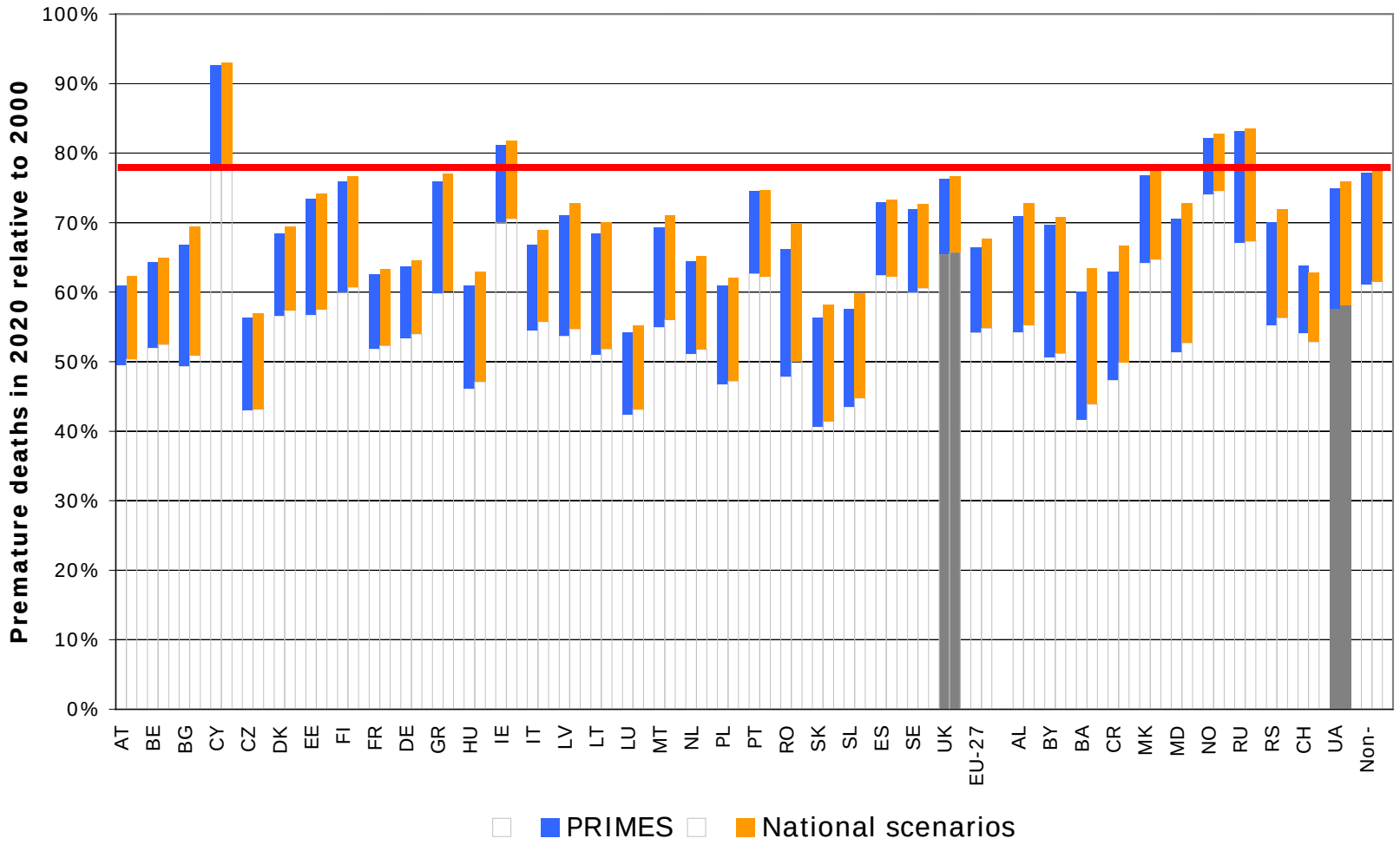
Mortality due to PM2.5 (YOLLs)



Provisional results!

Option 2: Equal relative improvements compared to 2000

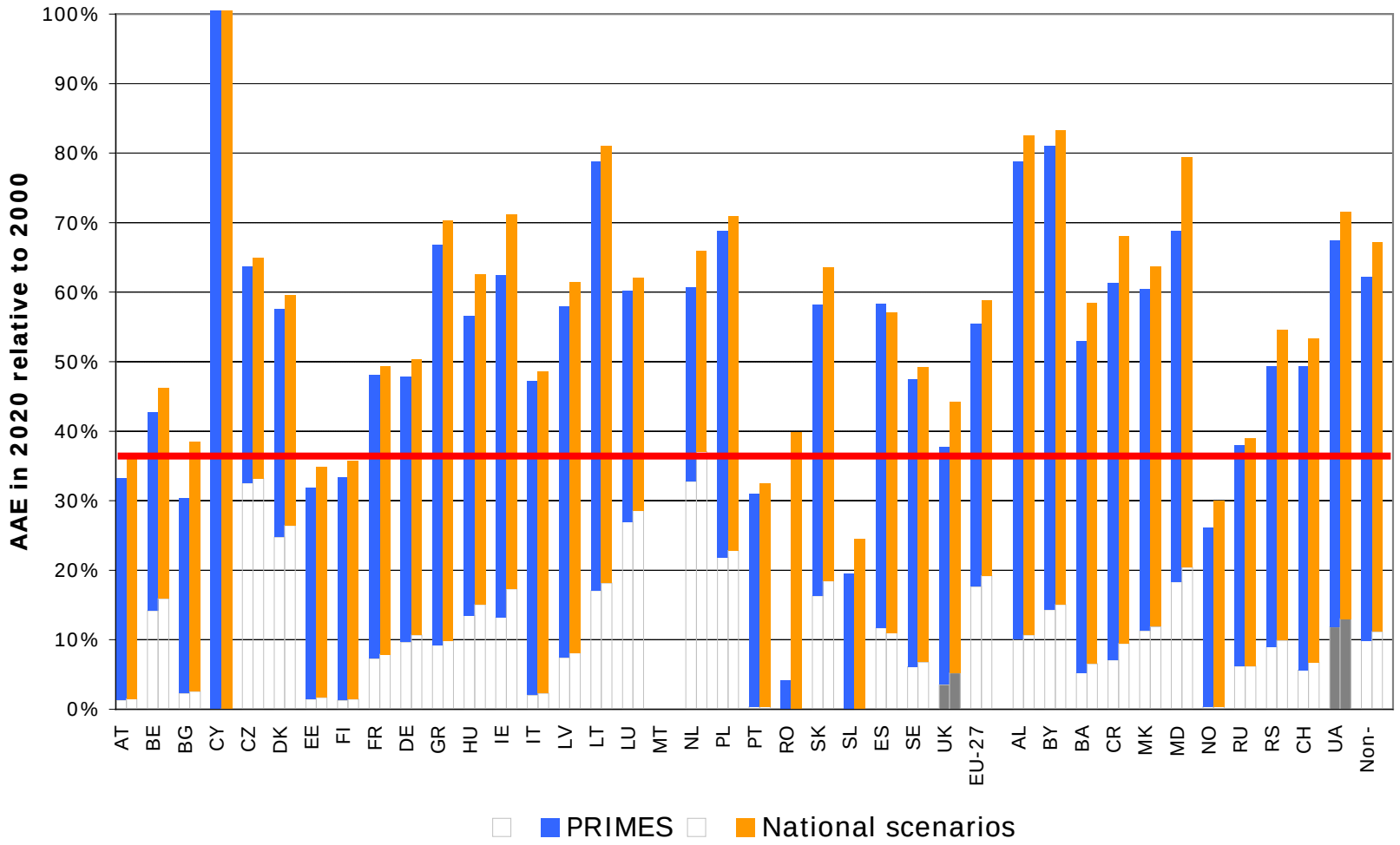
Mortality due to ozone



Provisional results!

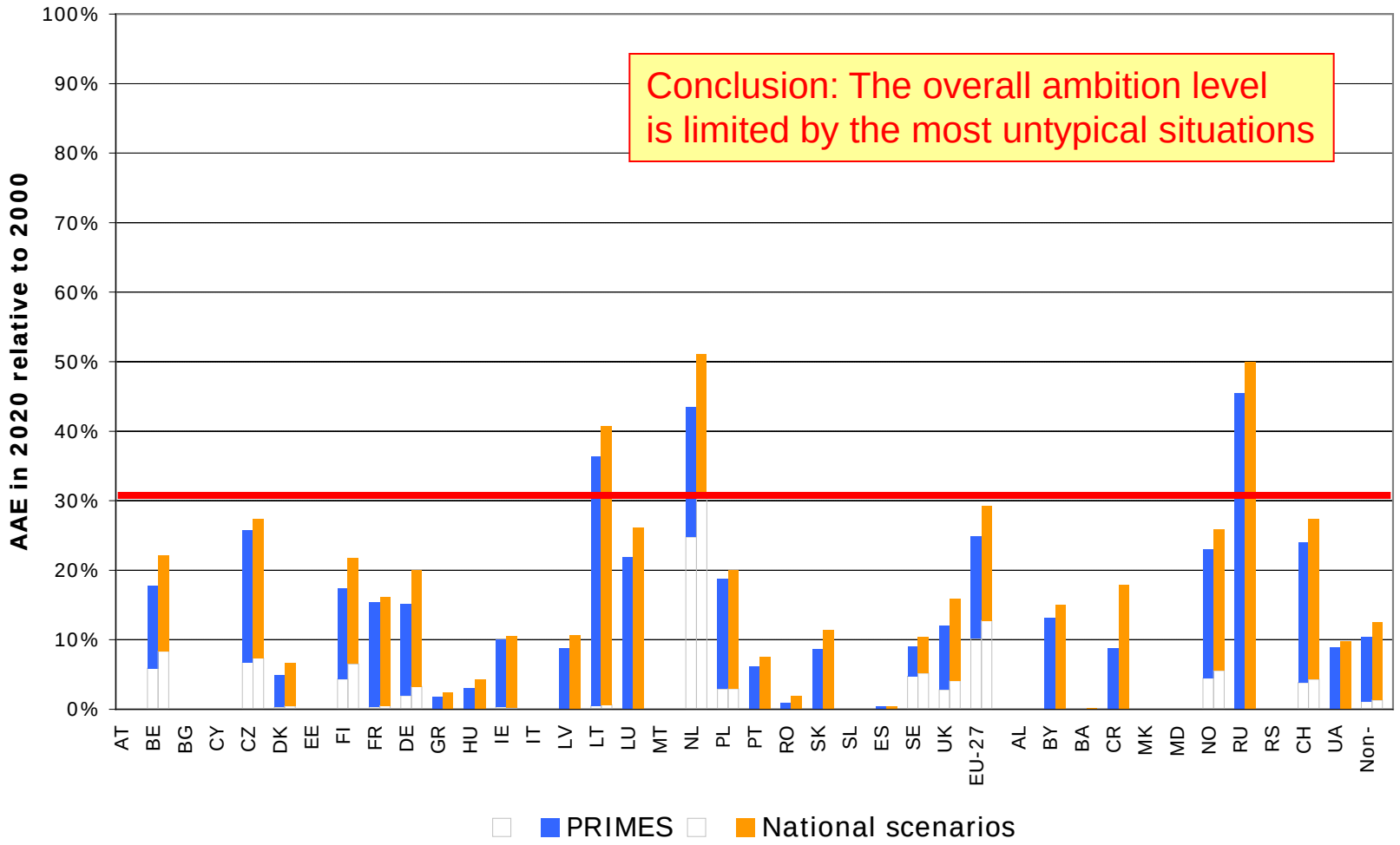
Option 2: Equal relative improvements compared to 2000

Eutrophication, accumulated excess deposition



Option 2: Equal relative improvements compared to 2000

Acidification, accumulated excess deposition



Options for target setting for a cost-effectiveness optimization

- Targets
  - must be achievable in all countries
  - should result in internationally balanced costs and benefits

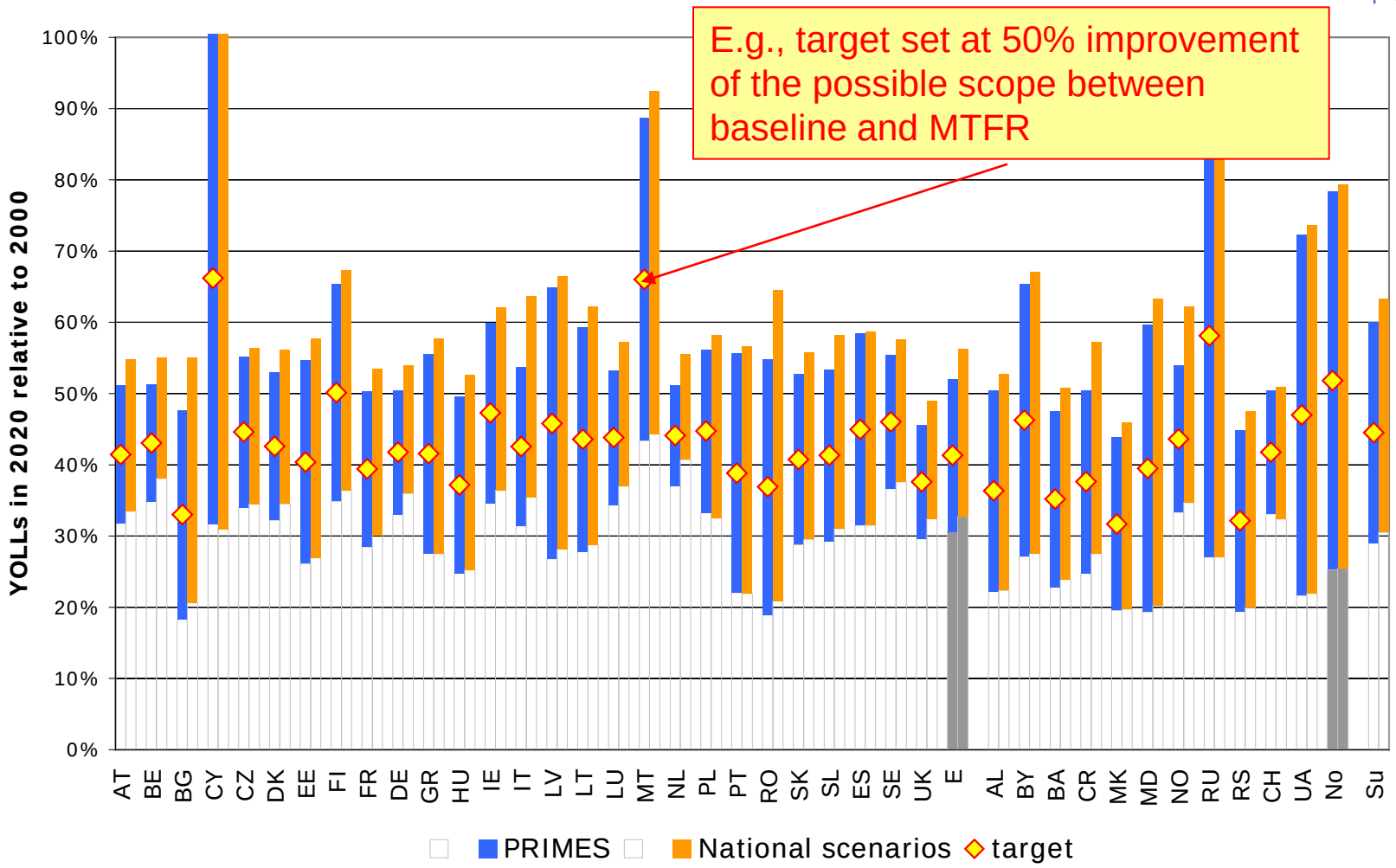
- Option 1: Uniform absolute targets (‘caps’) on environmental quality (in terms of impact indicators)

- Option 2: Equal relative change (‘gap closure’) in impact indicators compared to a base year

- Option 3: Achieve equal portions of the possible improvements (equal ‘gap closure’ between Baseline and MTFR)

Option 3: Equal progress of the feasible improvement

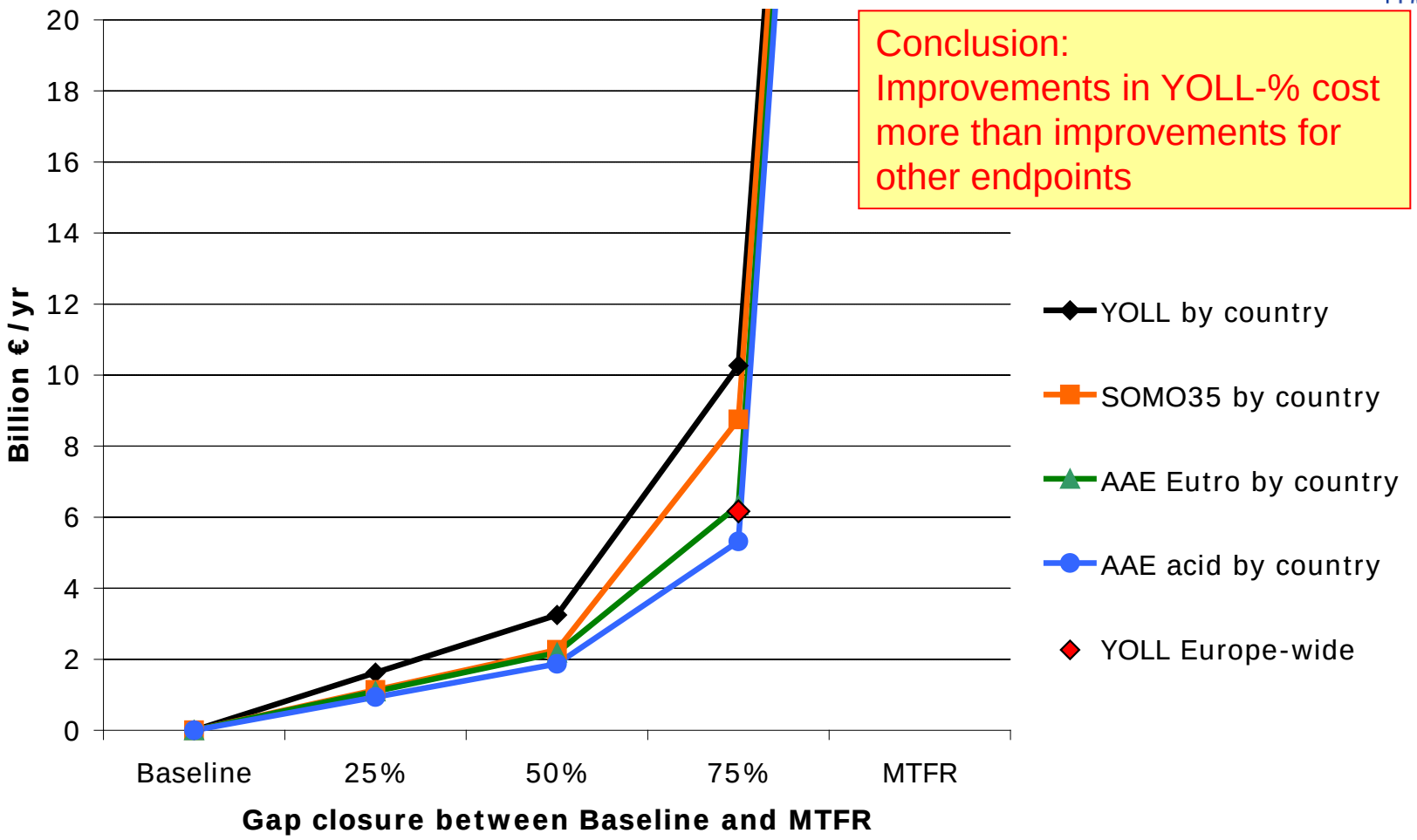
Mortality due to PM2.5 (YOLLs)



Provisional results!

Costs for different gap closure targets

between baseline and MTFR

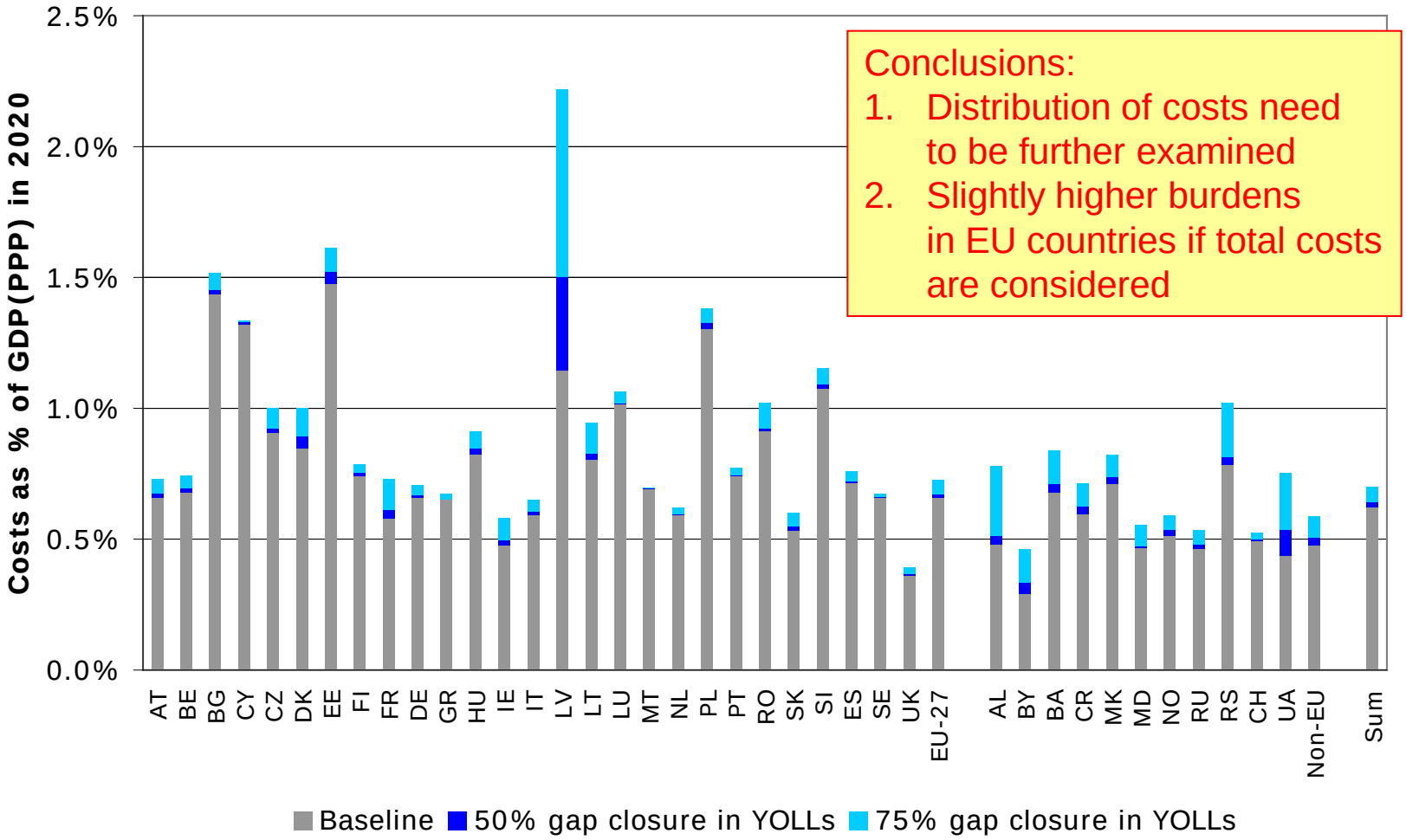


Conclusion:
Improvements in YOLL-% cost more than improvements for other endpoints

Provisional results!

Emission control costs (% of GDP-PPP)

for YOLL targets (for PRIMES baseline)



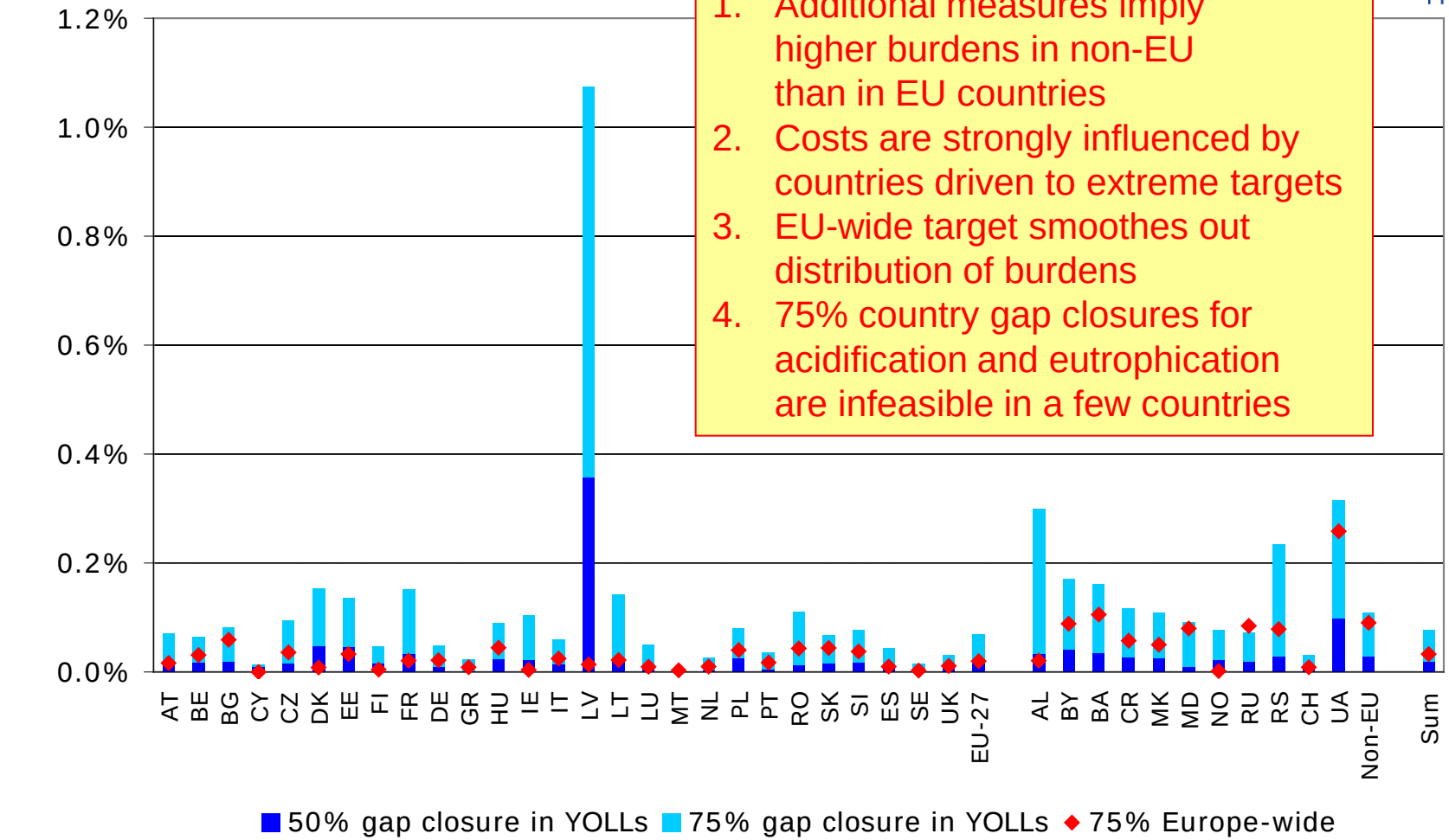
Conclusions:

1. Distribution of costs need to be further examined
2. Slightly higher burdens in EU countries if total costs are considered

Provisional results!

Additional emission control costs (% of GDP-PPP)

for YOLL targets (on top of baseline costs, for PRIMES baseline)



Provisional results!

Conclusions

- Provisional results, do not include urban increments for PM and O_3
- The target setting approach will determine the ambition level and distribution of costs:
  - Uniform absolute caps on environmental quality indicators will not produce equitable distributions of reduction costs.
  - Also equal relative improvements compared to a base year (e.g., 2000) are constrained by some countries with untypical situations.
  - Equal '**equal portions of the possible improvements**' targets are feasible and lead to more equitable distributions of costs, but are sensitive to weakly defined baselines and MTFRs.
  - Distributional effects are crucial. For YOLLs, such gap closure approaches would imply slightly higher (total) emission control cost burdens for EU countries, although additional cost burdens would be higher in non-EU countries.
  - Larger spatial flexibility in achieving a reduction target will reduce costs, but result in uneven environmental benefits. (Might be acceptable for YOLLs, but questionable for ecosystems.)

Questions to decision makers

1. Would an ‘equal portions of the possible improvements’ approach between baseline and MTFR be acceptable as a way forward?

2. Which distribution of (total/additional) costs between EU (mostly Gothenburg ratifiers) and non-EU (mostly non-ratifier) countries would be considered as fair and politically acceptable?

3. How much flexibility in the spatial re-distribution of environmental benefits would be politically acceptable?

4. Which target (cost) range should be further examined?