



Convention on Long-range Transboundary Air Pollution

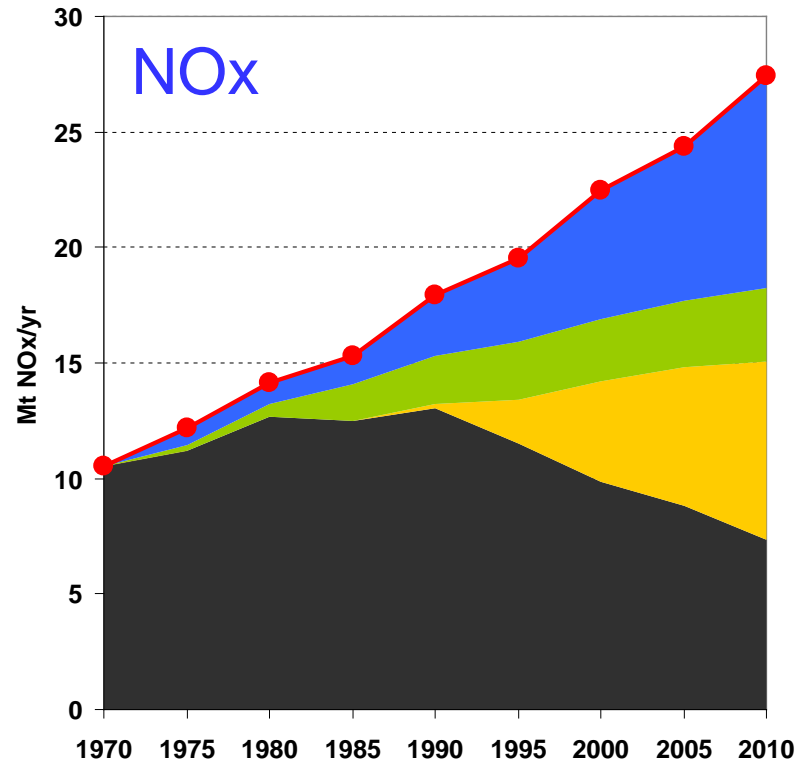
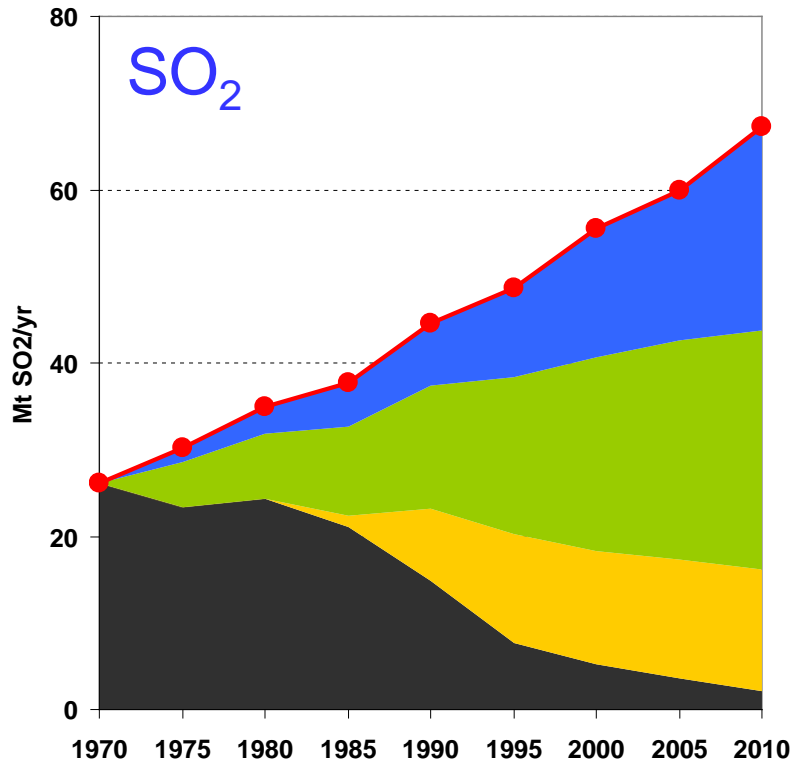
Status of the revision of the Gothenburg Protocol

48th meeting, Working Group of Strategies and Review
11-15 April, Geneva

Briefing by the chair

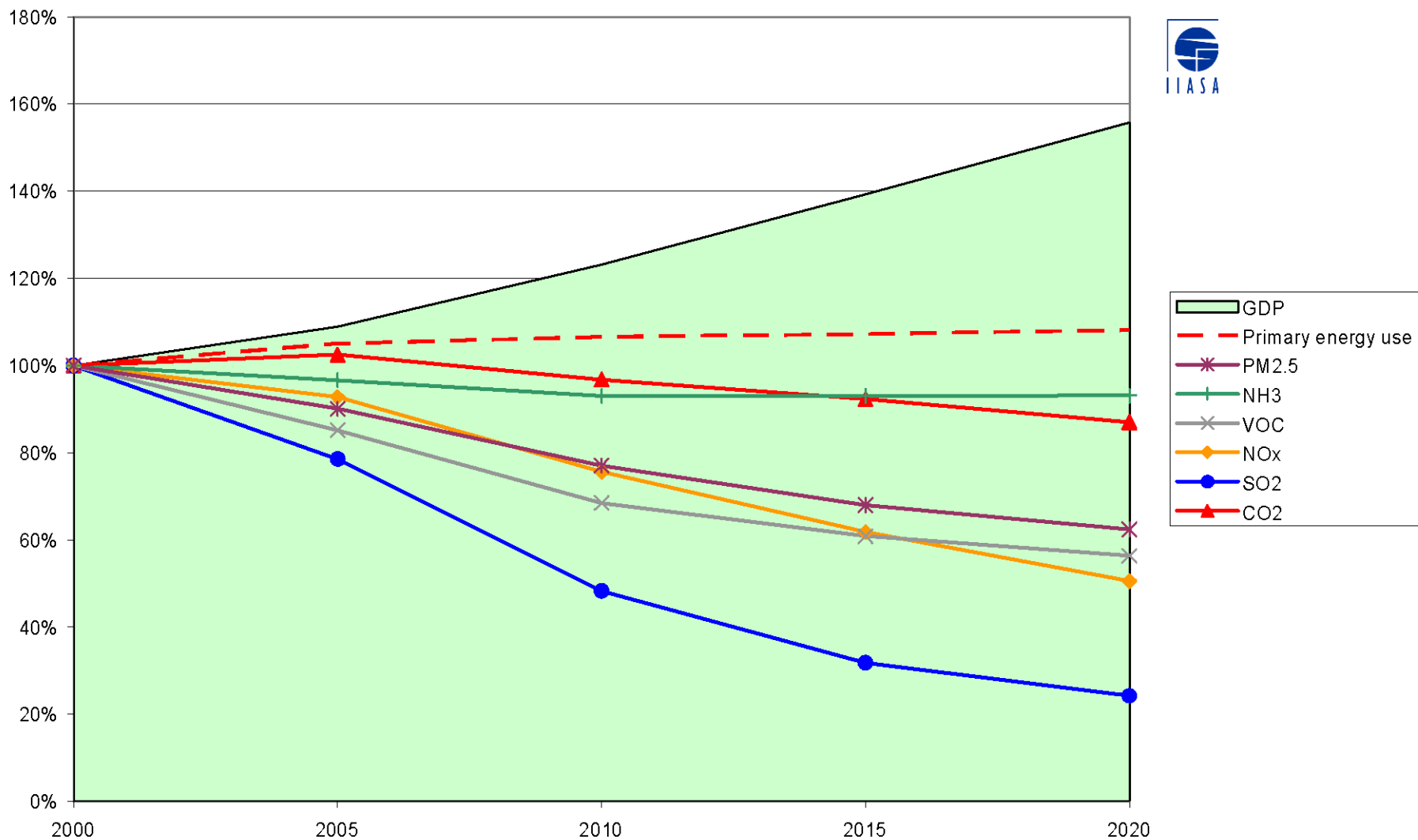


Factors determining European SO₂ and NO_x emissions, 1970-2010



- Avoided through energy intensity improvement of GDP
- Avoided through changes in the energy mix
- Avoided through end-of-pipe measures
- Remaining emissions
- Hypothetical uncontrolled emissions for constant energy

Emissions of all pollutants decline, but ammonia hardly





Ambition levels for Europe: trade-off between costs and impacts

		2020 BL	LOW	Low*	MID	High*	HIGH	MTFR
<i>Additional cost above BL 2020</i>								
Costs	million €/yr	0	610	905	2.262	5.380	10.752	69.155
	% of GDP	0	0,00	0,01	0,01	0,03	0,07	0,45
<i>Resulting changes from 2000</i>								
Reduced impacts %	Loss in life expectancy	43	51	51	57	63	63	69
	Acidification	69	74	76	80	85	84	89
	Eutrophication	29	36	42	45	50	50	57
	Premature deaths ozone	32	34	34	35	36	39	41

More N-reduction

Less ozone-reduction

Each step =

- ~ 10.000 live years gained
- ~ €2 billion saved due to less absence
- ~ 20.000 km² protected from acidification
- ~150.000 km² protected from eutrophication
- But at increasing costs

What choice to make?



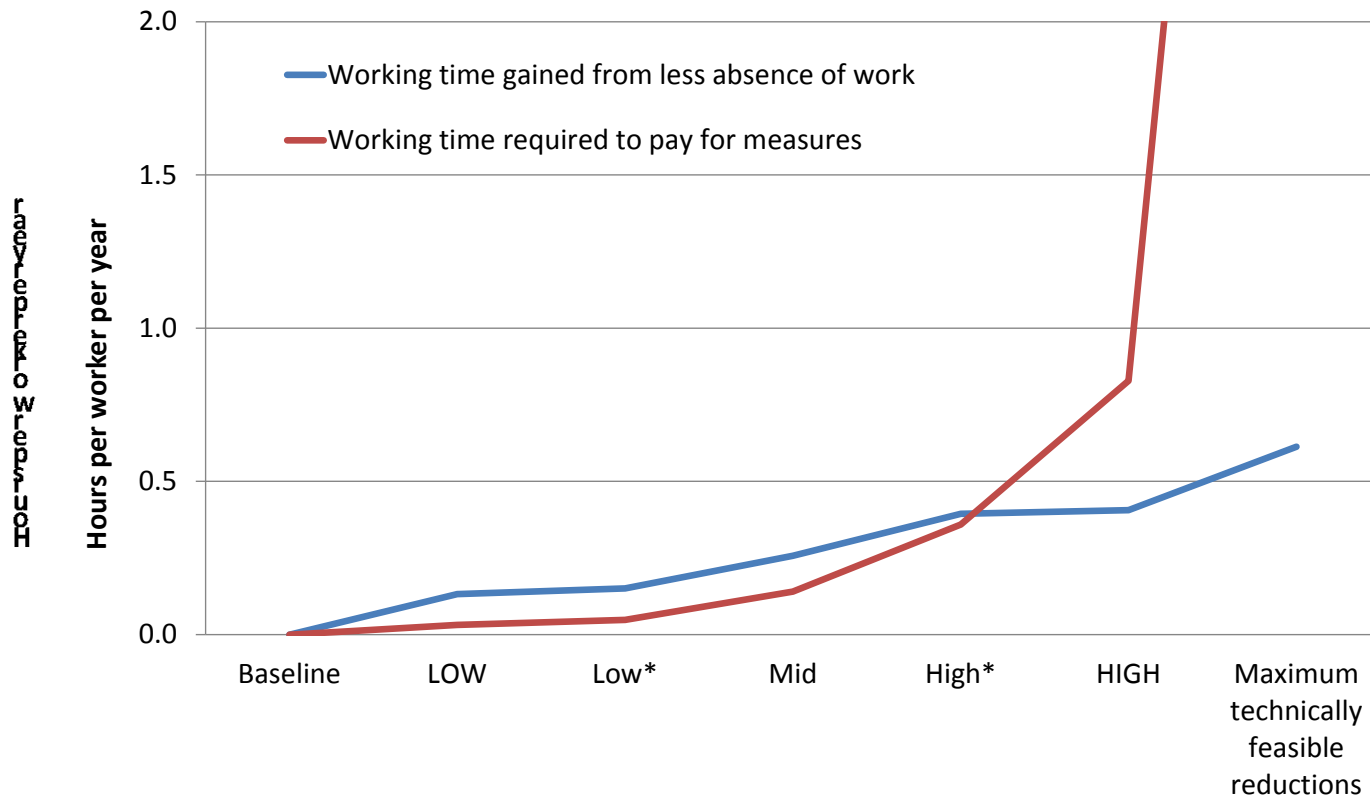
EU-TSAP: willingness to pay = €1.5 bn

		2020 BL	LOW	Low*	MID	High*	HIGH	MTFR
<i>Additional cost above BL 2020</i>								
Costs	million €/year	0	245	319	864	2.288	3.807	49.117
	% of GDP	0	0,00	0,00	0,01	0,02	0,05	0,65
<i>Resulting changes from 2000</i>								
Reduced impacts %	Loss in life expectancy	52	56	56	59	63	63	69
	Acidification	70	74	76	80	84	84	88
	Eutrophication	21	28	34	37	42	42	50
	Premature deaths ozone	34	37	37	38	39	41	43
Emission reduction %	SO ₂	74	75	74	76	80	79	83
	NO _x	55	57	58	59	60	62	64
	PM _{2.5}	39	46	45	48	52	52	67
	NH ₃	9	18	27	30	35	32	41
	VOC	46	49	49	50	51	55	63

Risks EU:

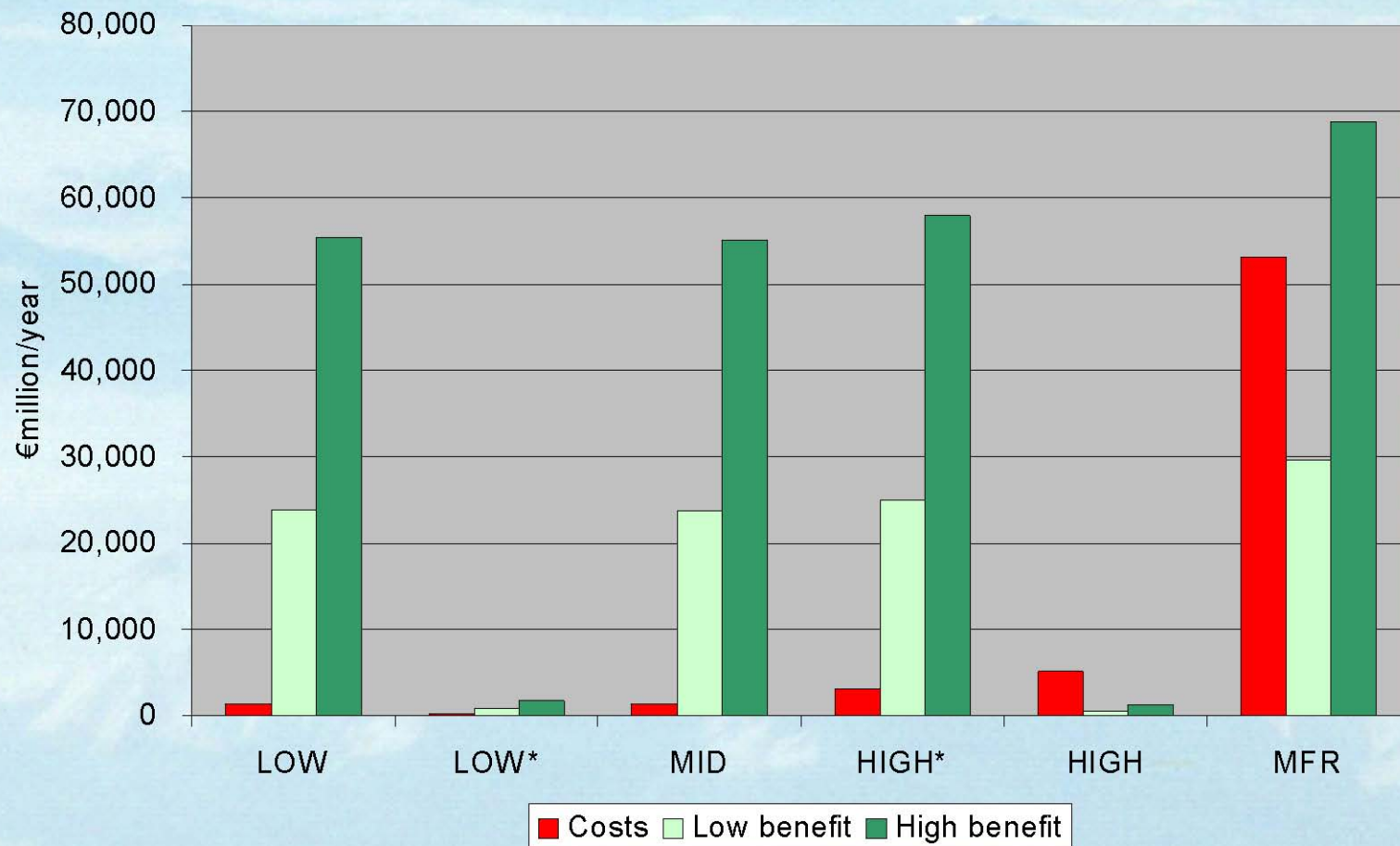
- **No reduction in non-EU countries**
- **Energy policy in 2020BL less successful: then higher costs, and additional NH₃ reduction would become more cost-effective**

There is potential for further cost-effective action with large benefits



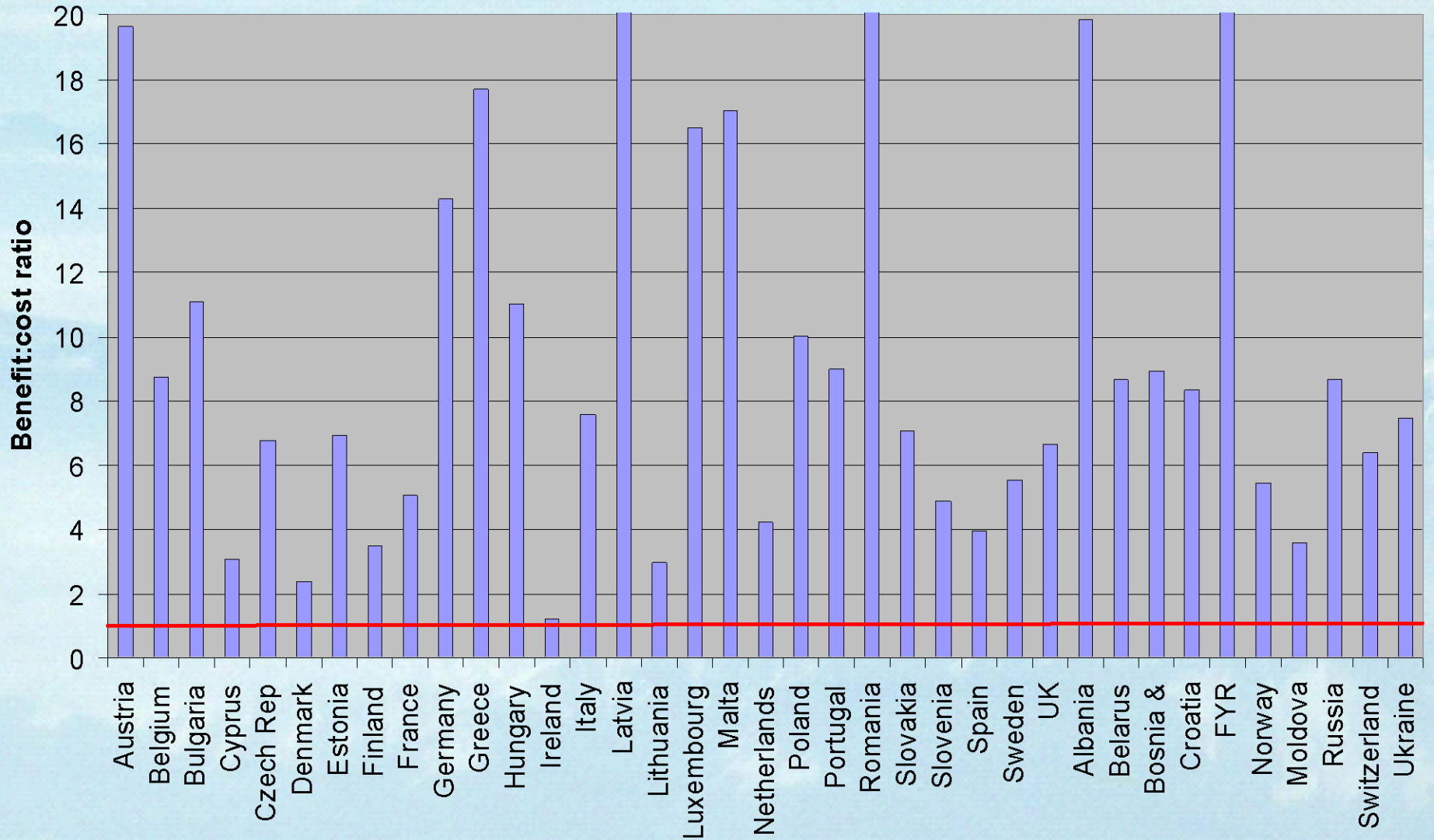
Emission control cases in CIAM 1/2011 report

Quasi-marginal comparison of costs and benefits (additional costs and benefits to previous scenario)



Source: Mike Holland

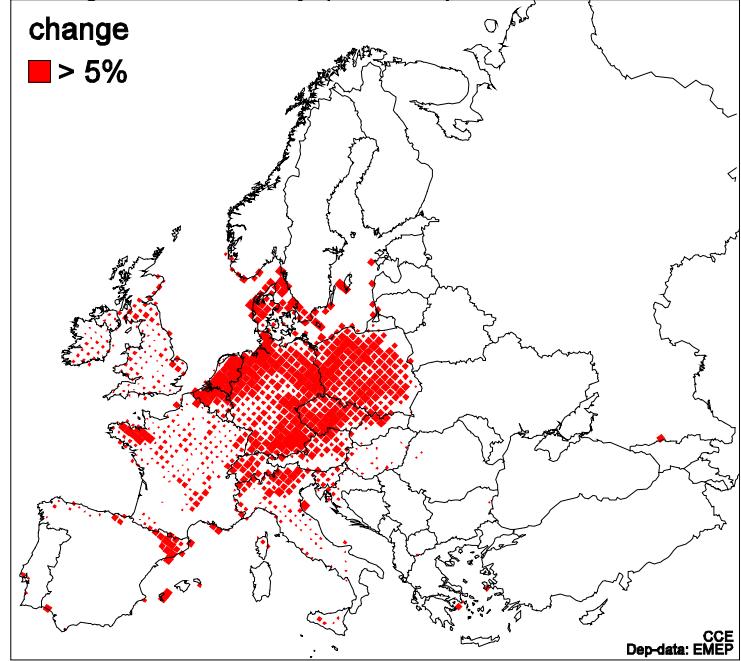
Quasi-marginal benefit-cost ratios for HIGH*



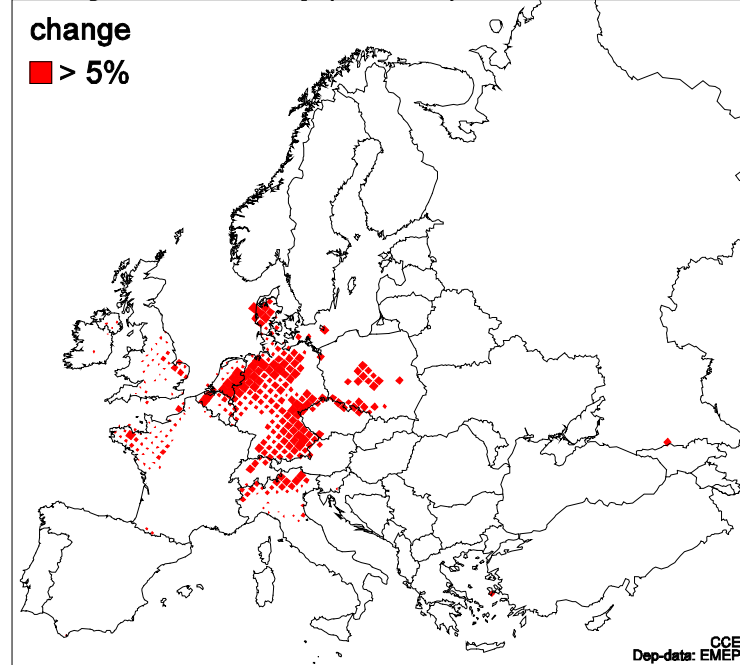
Conservative assumptions: VOLY median valuation, UNECE adjusted valuation, only health impacts included, not damage to ecosystems, crops and materials.
 Red line shows BCR=1, above which net benefit recorded. Source: Mike Holland

- In co-operation with the Working Group on Effects
- Joint background report to the revised Gothenburg Protocol
- Including indicators as mentioned in Annex 1 & guidance document and the results of GAINS and the cost-benefit analysis

Change in biodiversity (E,F2,G3) NAT 2000

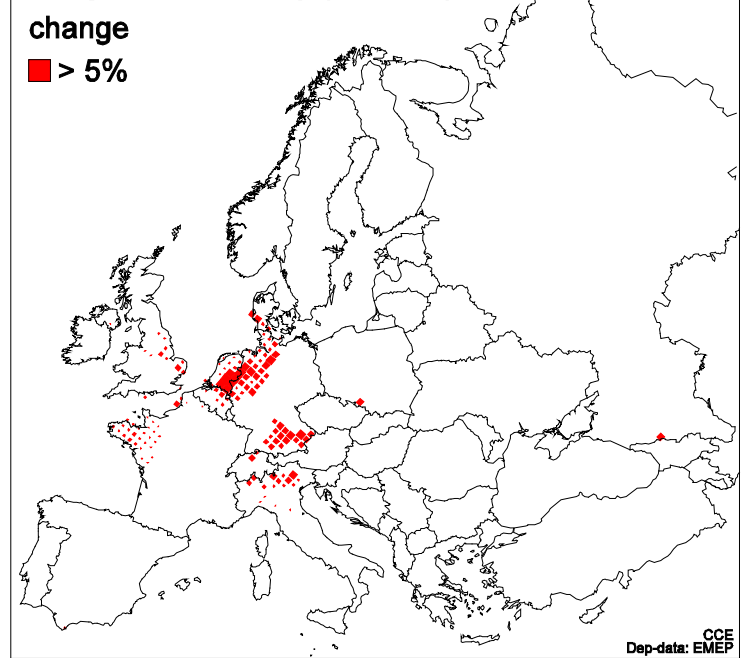


Change in biodiversity (E,F2,G3) COB 2020

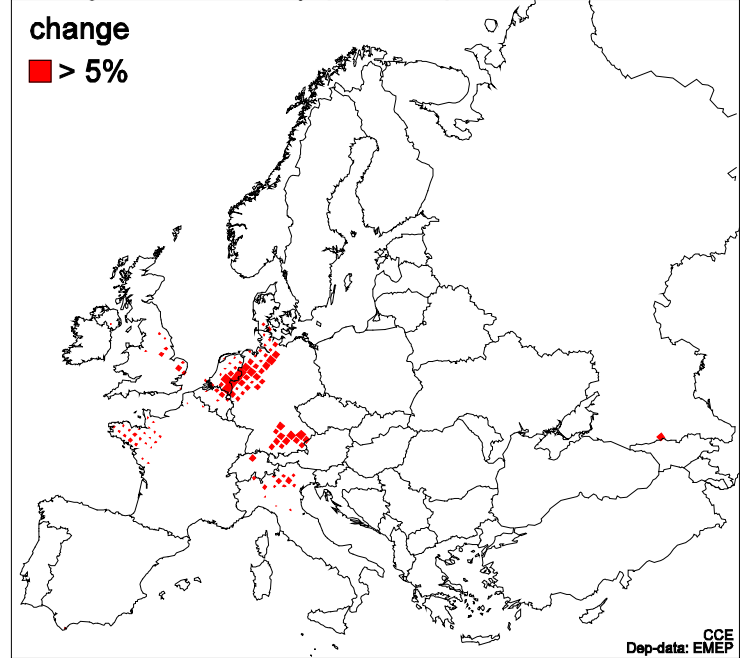


Ex-post Impact Analysis WGE/CCE

Change in biodiversity (E,F2,G3) MID 2020



Change in biodiversity (E,F2,G3) HIGH 2020



- More flexibility !
- Ensure participation from EECCA →
- Limit number of obligatory technical measures
- Focus on ~ 10 key measures
- Give more time for implementation
- For Russia: focus on PEMA-oblasts
- Check feasibility of ambition levels against national scenario & key measures

Key measures for the mid case



SO₂:

FGD for power plants in non-EU

Low S coal in domestic sector in new EU Member States

NO_x:

SCR for power plants in non-EU

NO_x controls in some industrial sectors (e.g., cement) (EU and non-EU)

PM2.5:

Dust control for iron & steel industry in non-EU

Agricultural waste burning (EU and non-EU)

NH₃:

BC → wood burning + diesel particle traps

Measures for cattle, pig and poultry farms Cattle = 50% NH₃ emissions!

Substitution of urea fertilizer

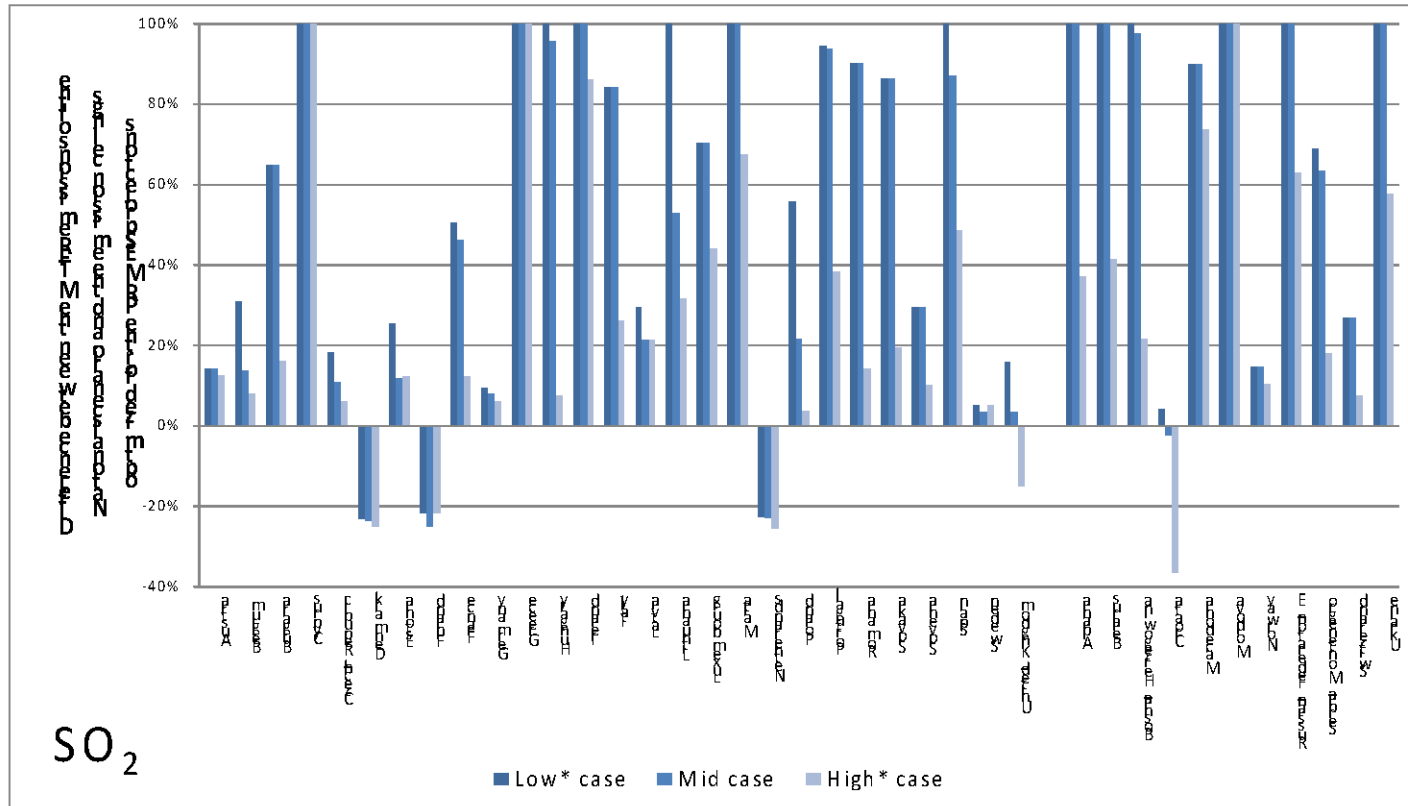
Agricultural waste burning (EU and non-EU)

VOC:

Additional measures for sectors falling under the Solvents Directive

Agricultural waste burning (EU and non-EU)

Sensitivity analysis based on National activity projections: Distance between optimized cases and MTR of national scenario



- Emission ceilings could become unachievable for fundamentally different assumptions on energy and agricultural policies (compared to PRIMES/CAPRI)



Infeasibility of the MID-case when using national data

SO ₂	NO _x	NH ₃	VOC	PM _{2.5}
Czech Rep				
Finland				
Netherlands	Netherlands		Netherlands	
Croatia	Croatia	Croatia		
	Denmark			
		Romania		

■ Flexibility needed:

- Some sources not included: e.g. NO_x from agricultural soil, VOC from crops
- Several PM_{2.5}/BC emission sources probably lacking and emission factors uncertain



40th meeting TFIAM

18-21 May Oslo

Focus on:

1. Feasibility emission ceilings based on national data
2. For EECCA/SEE: impacts of key measures
3. Input to the 49th meeting of WGSR (Sept 2011)
4. Outline joint TFIAM/WGE report

Time schedule

TFIAM

2010

Feb: Baseline proposal

May: Analyses of targets options

Nov: Sensitivity analysis

2011

Jan/Feb: Scenario runs

May: Final runs

Dec: Report (with WGE)

WGSR

2010

Apr: Baseline accepted

Sept: Guidance on targets

Dec(EB): Guidance on targets

2011

April: Ambition level

Sept: Proposed Protocol

Dec(EB): Final Protocol

