

Social costs, optimal policies and the value of information

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by

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Plan of talk

- The PAGE2002 model
- Impacts and social costs from PAGE2002
- Optimal strategies
- The value of better information



Scope of the PAGE2002 model

- Eight world regions.
- The major greenhouse gases.
- Abatement and adaptation costs,
- Economic and non-economic impacts.
- Time horizon of 2200.
- Probabilistic calculations.



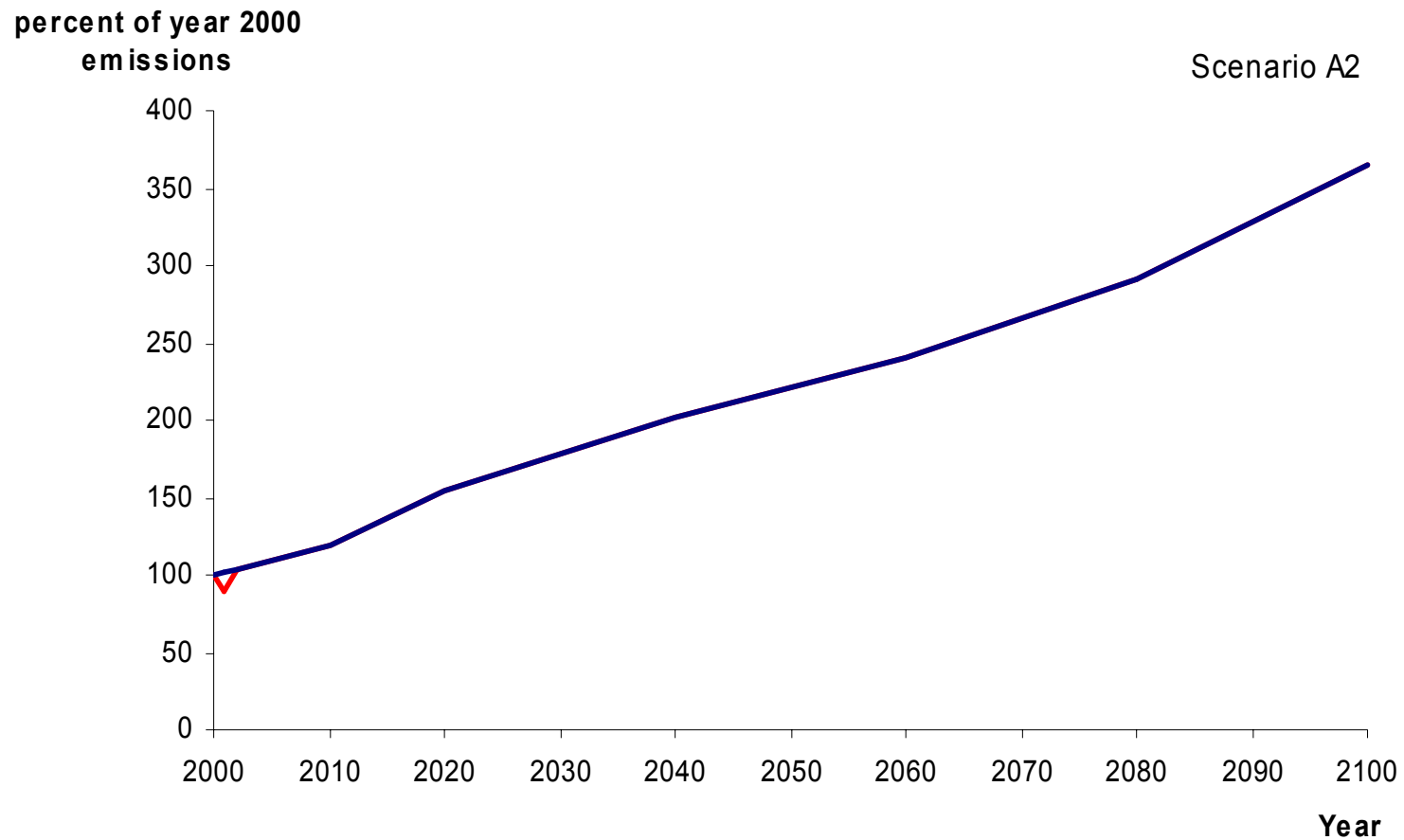
Inputs to the PAGE2002 model

- Emissions of greenhouse gases
- Atmospheric residence time of greenhouse gases
- Sensitivity of the climate system
- Cooling effect of sulphates
- Impact as a function of temperature change
- Marginal abatement costs as a function of cutbacks
- Discount rates and equity weights



Calculating social costs

CO2 emissions by year



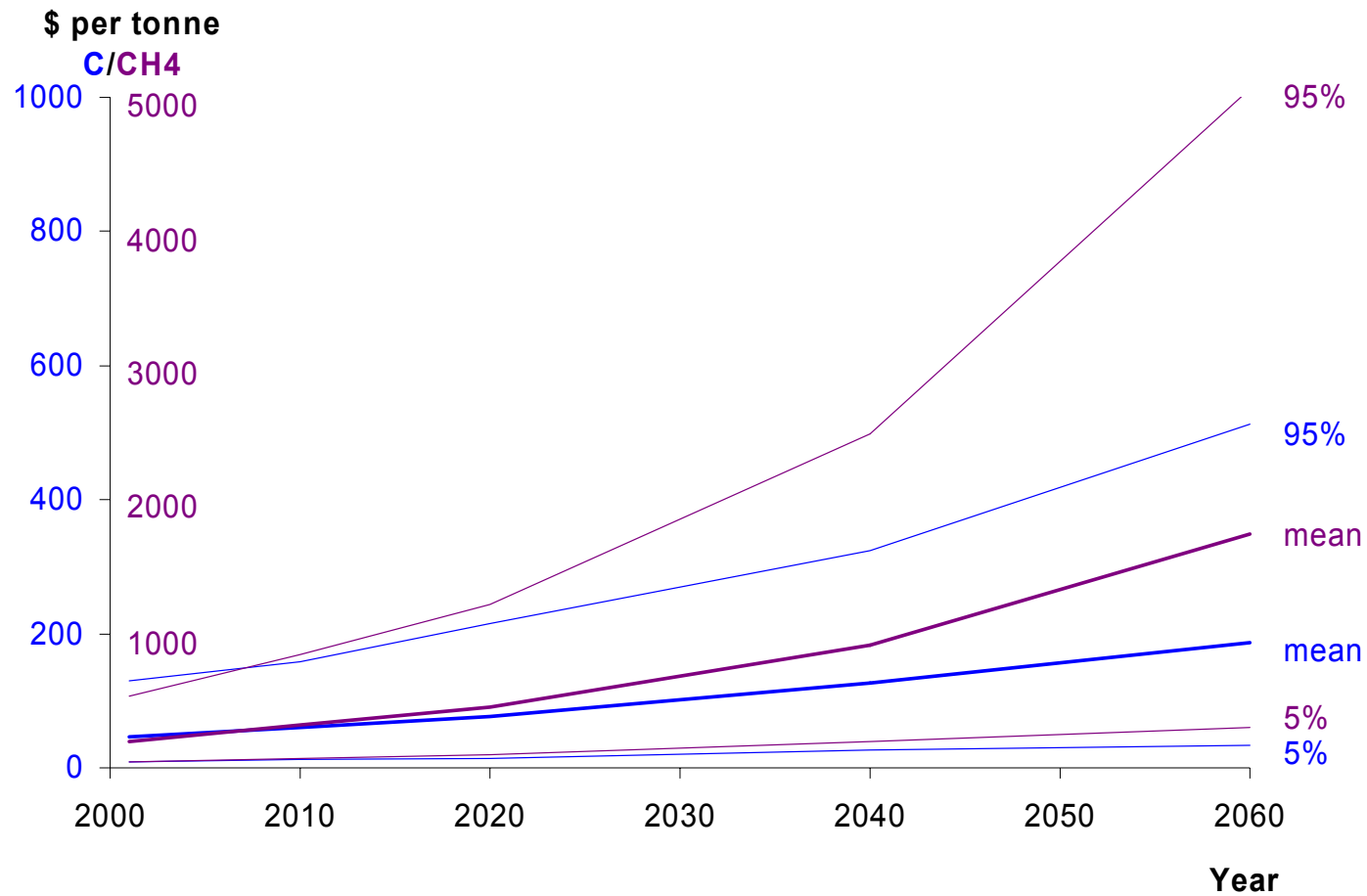
Social costs from PAGE2002

2000 - 2200	\$US (2000) per tonne		
	5%	mean	95%
C as CO₂	10	43	130
Methane	40	205	500
SF6	70 000	520 000	1500 000

Source: PAGE2002 model runs for IPCC Scenario A2

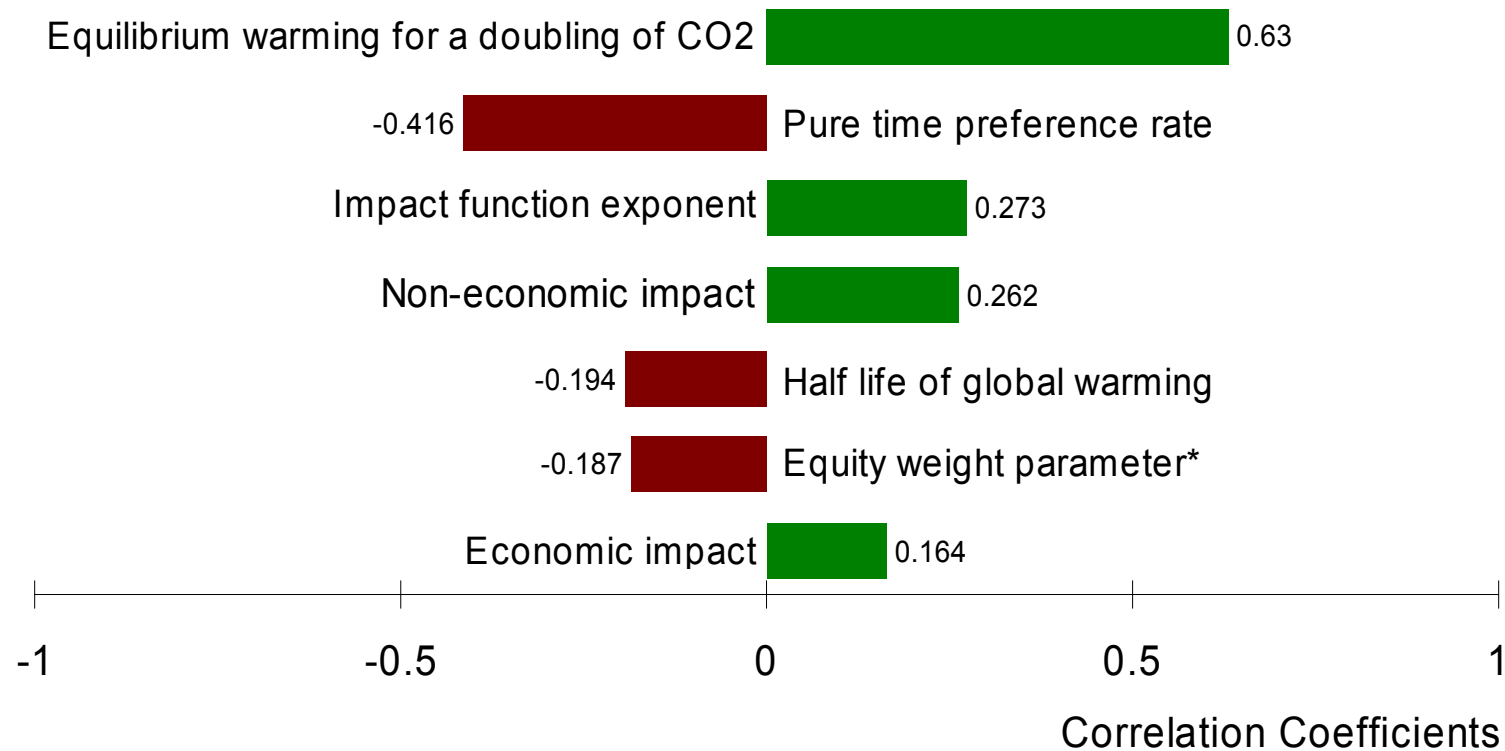


Social costs by date of emission



Source: PAGE2002 model runs for scenario A2

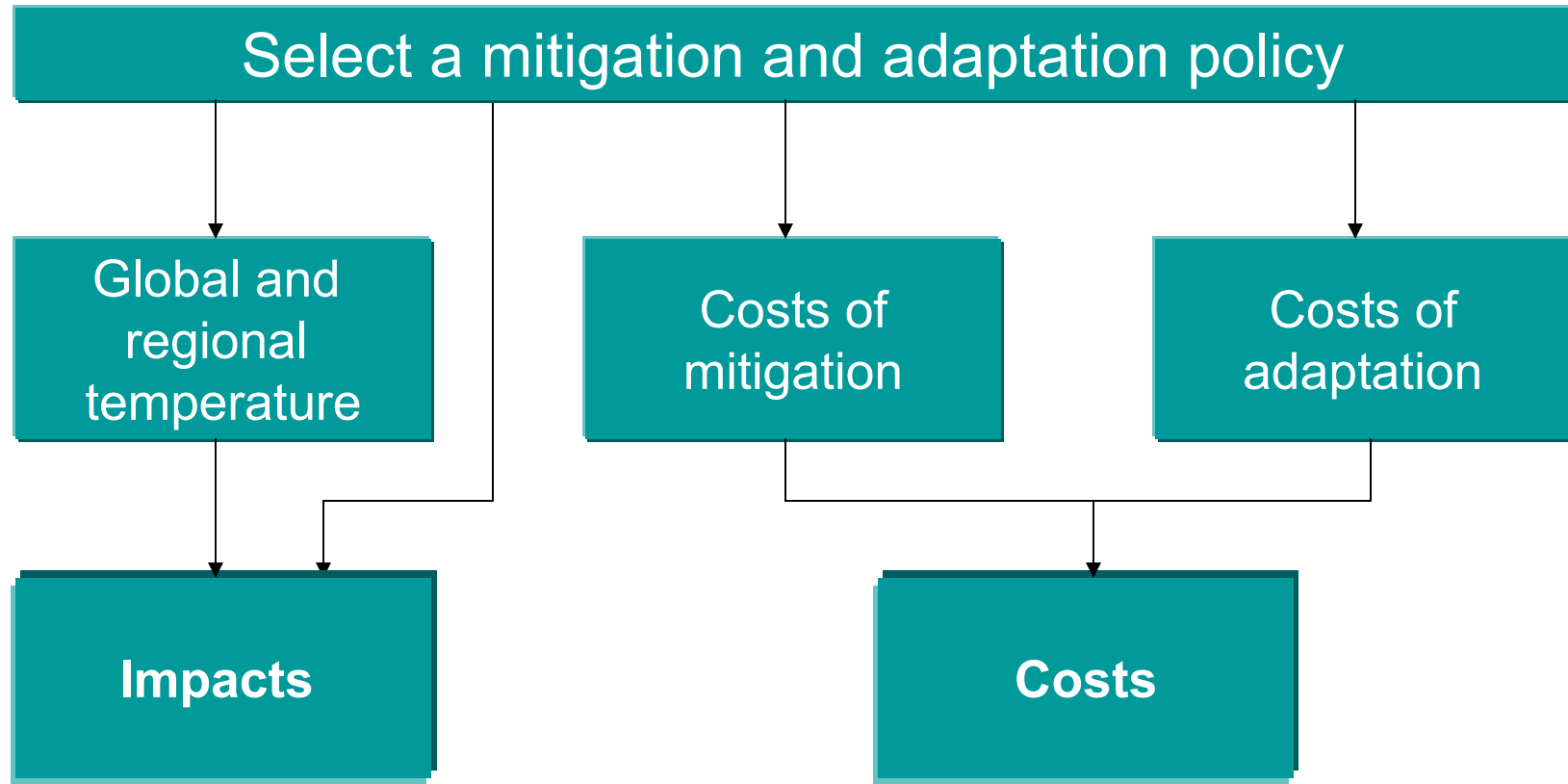
Major influences on the SCC



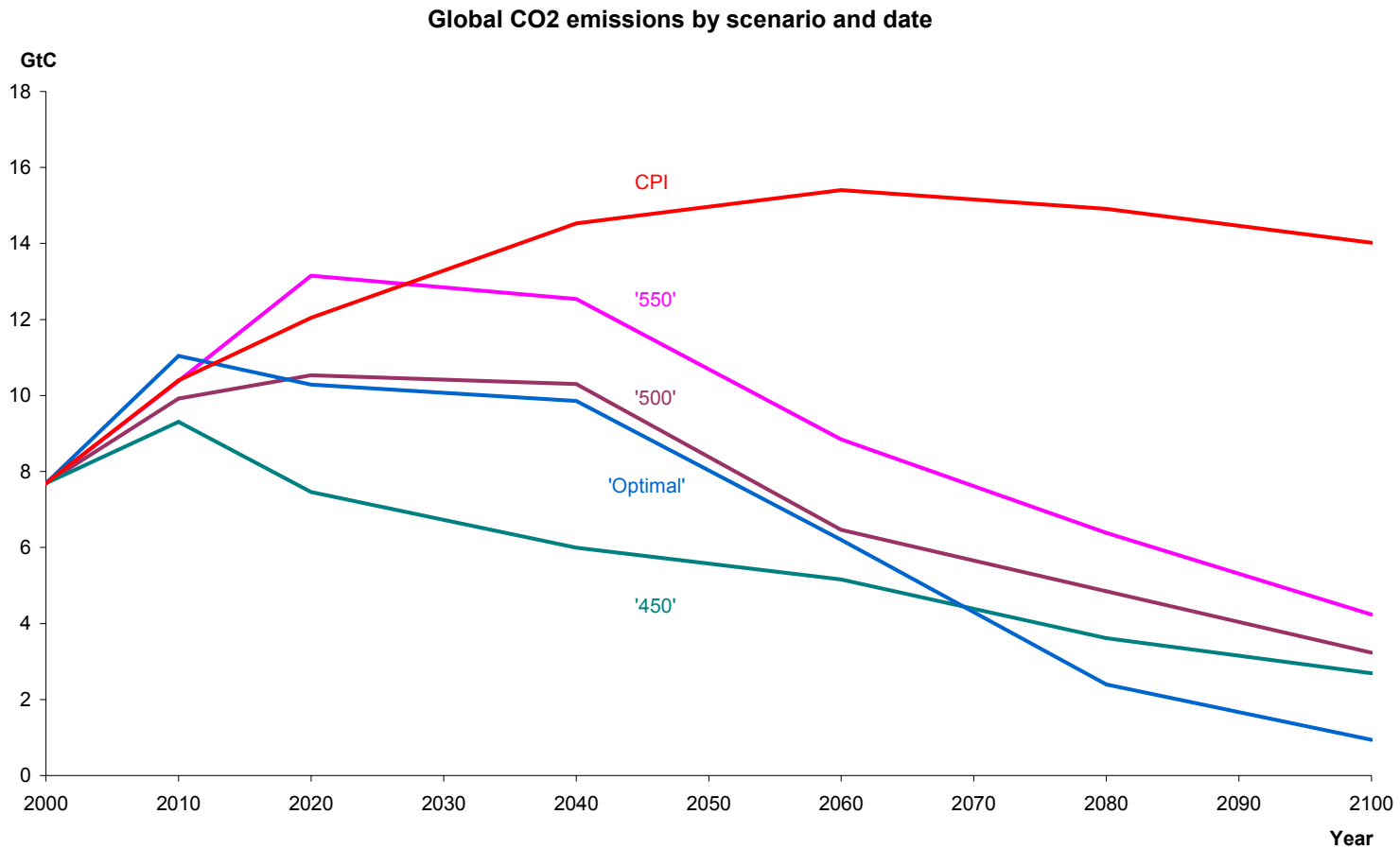
Source: PAGE2002 model runs for scenario A2



Structure of the PAGE2002 model



Emission scenarios and optimal emissions

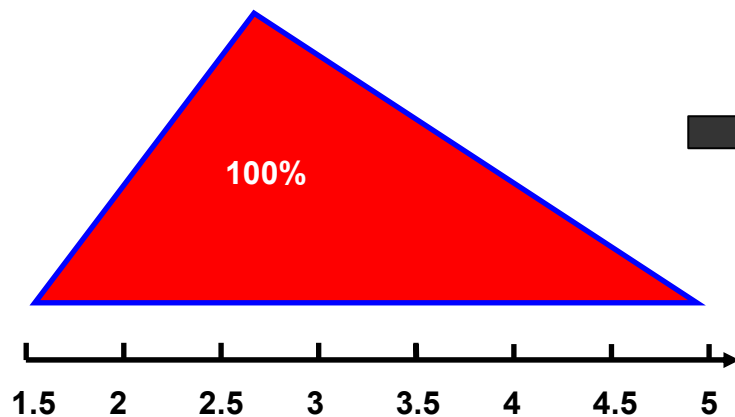


Source: PAGE2002 model runs from CPI baseline

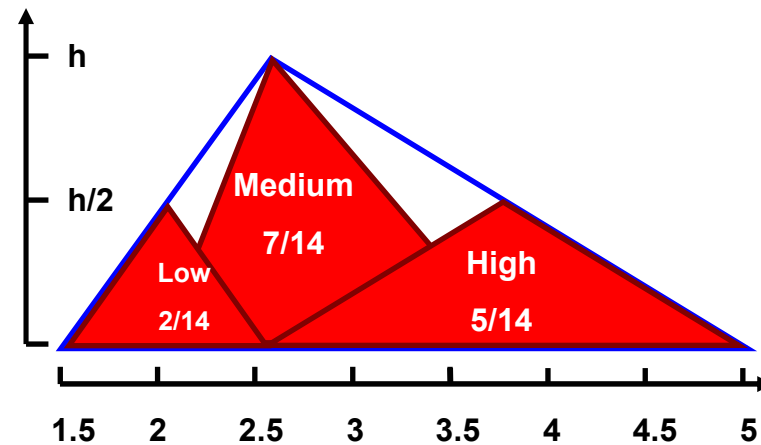
Better scientific information

Equilibrium warming for a doubling of CO2

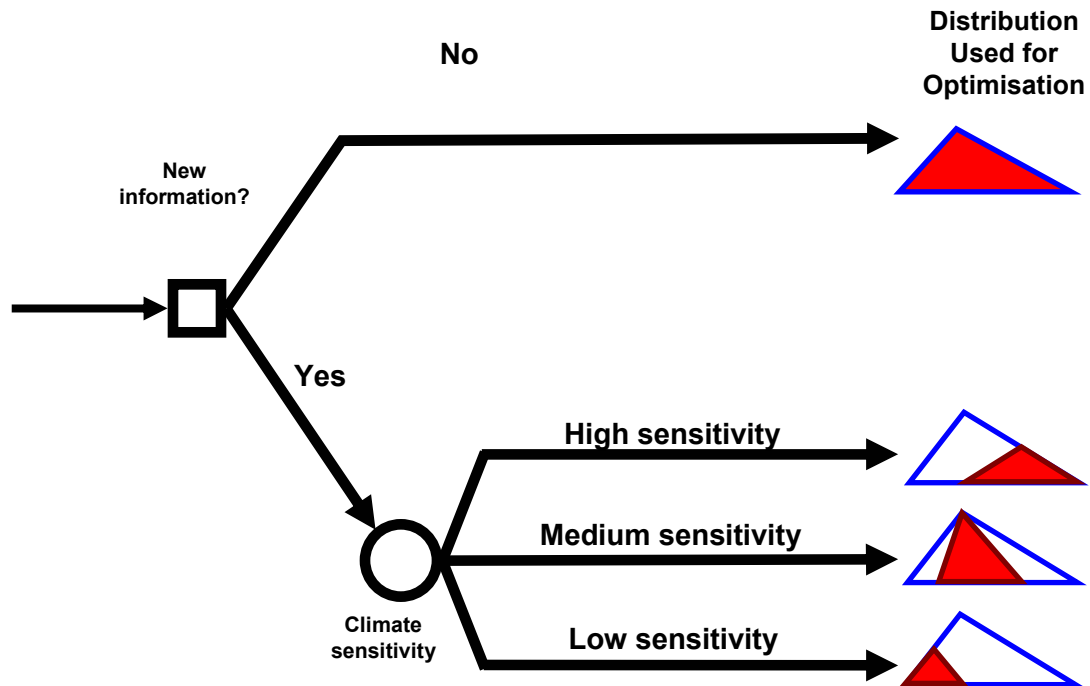
Prior Distribution



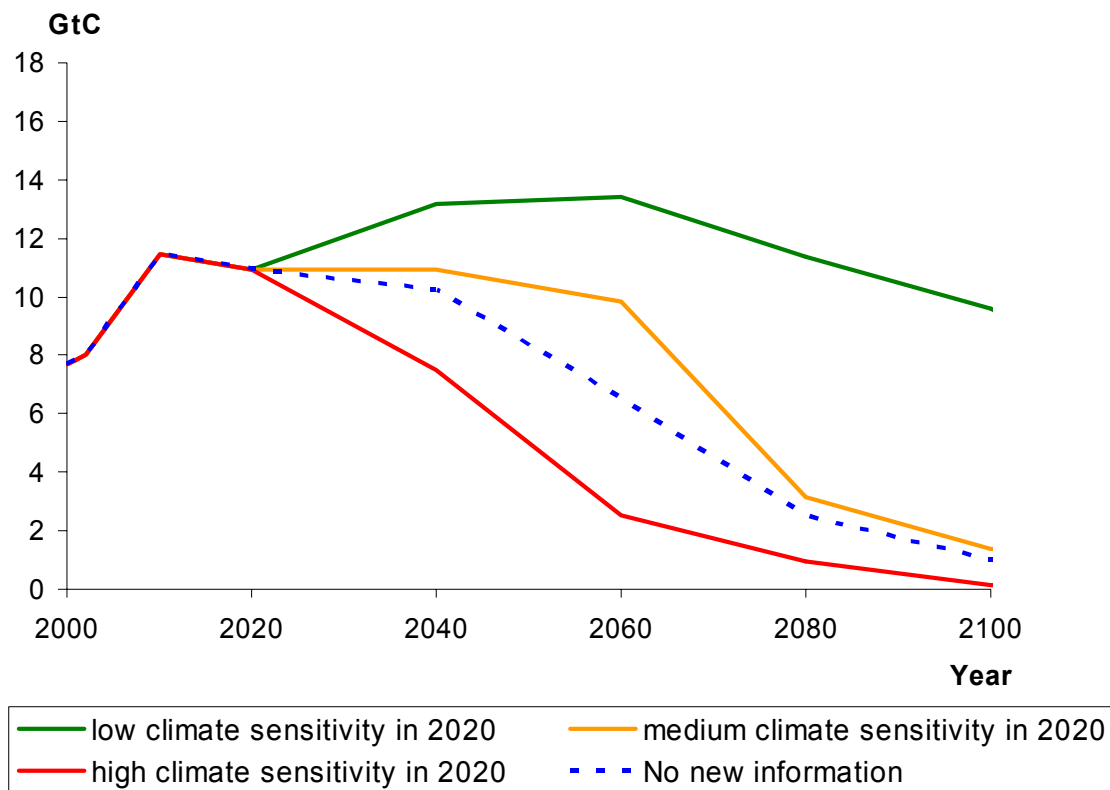
Posterior Distribution



The value of better information



Optimal emissions with better scientific information in 2020



Source: PAGE2002 model runs from CPI baseline

Mean NPV of the sum of climate change impacts and abatement costs

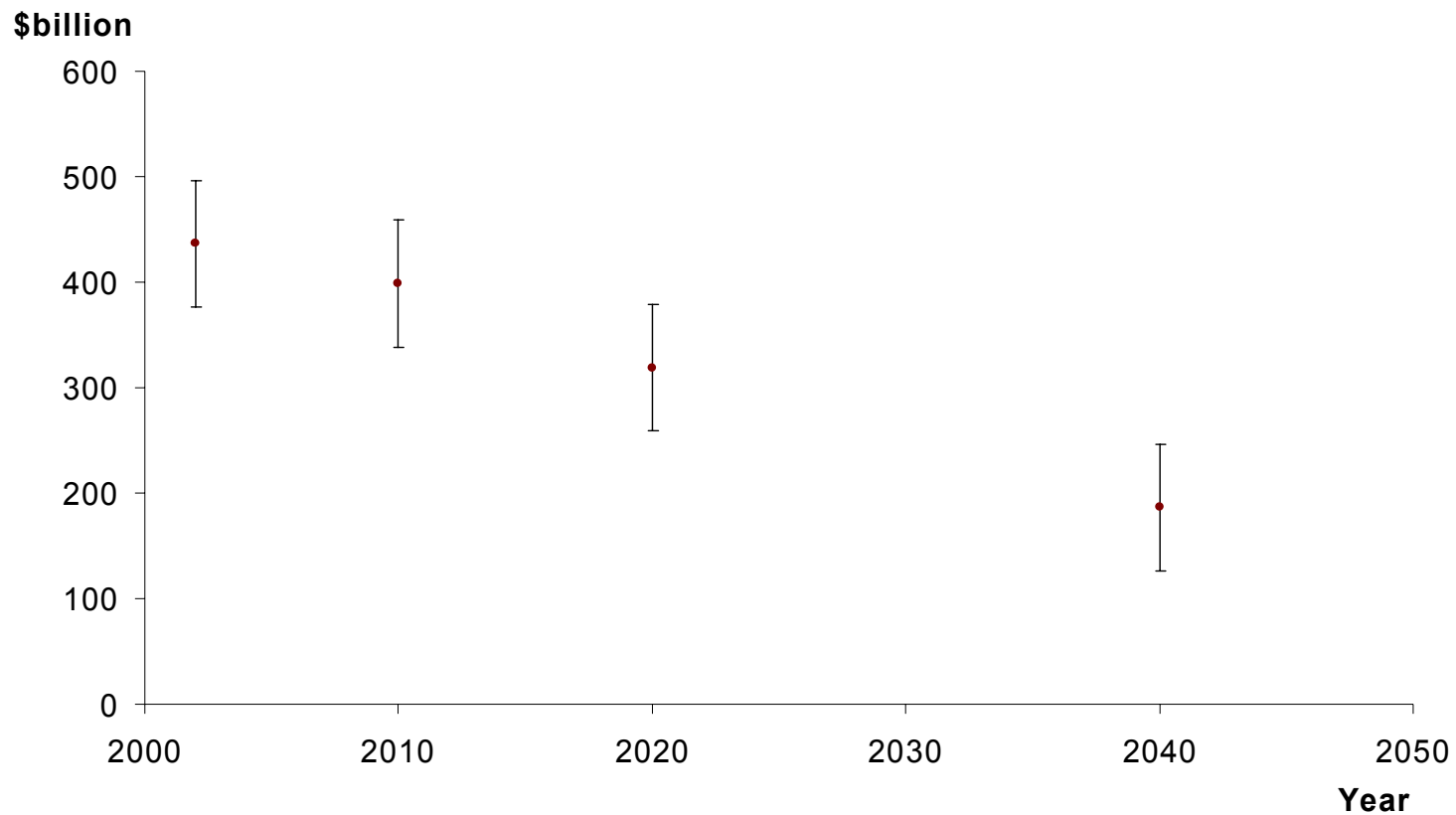
Billion USD (2000)

	Better information today	Better information in 2020
<i>No new information</i>	15,900	
high climate sensitivity	20,800	21,100
medium climate sensitivity	13,500	13,500
low climate sensitivity	9,100	9,200
<i>Weighted Average</i>	15,500	15,600
Value of information	400	300

Source: PAGE2002 model runs from CPI baseline



Value of better information by date



Source: PAGE2002 model runs from CPI baseline

Next steps

- Value of better information about economic parameters
- Incorporate induced technical change
- Better modelling of large-scale discontinuities

