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The importance of multi-metric, scale, and sector climate change impacts valuation

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Climate Change Impacts and Integrated Assessment: Critical Issues in Climate Change, Snowmass, CO

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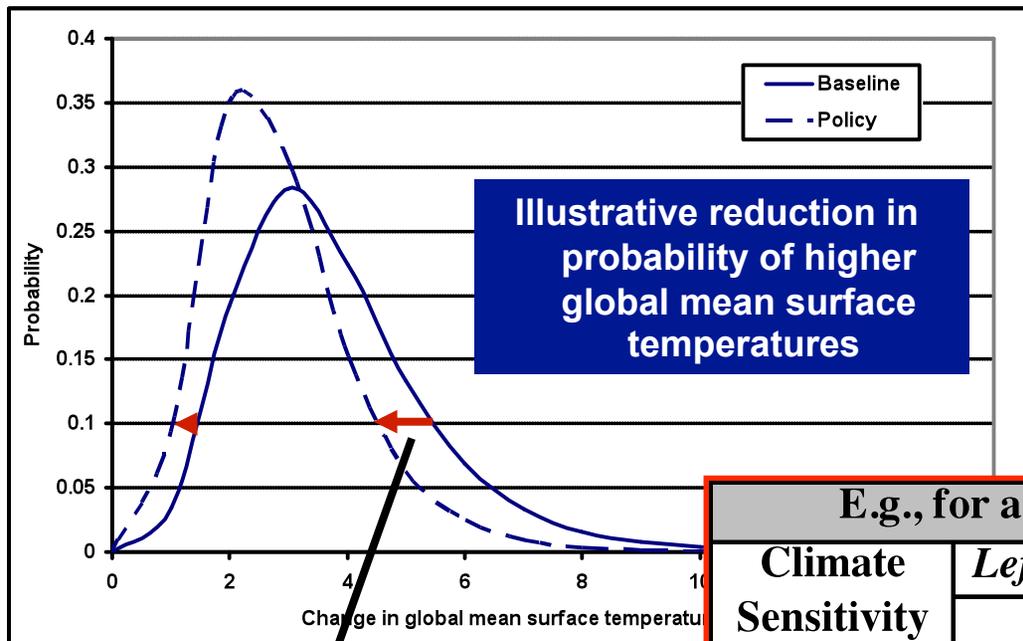


Different kinds of federal decisions with different information requirements

Type of decision	Decision process	Types of impacts information					Point/distribution	Information requirements
		Qualitative/quantitative	Nonmonetary/monetary	Observed/projected	Domestic/Global	Incremental/non-incremental		
<i>Determining if there is a potential threat</i>	U.S. Supreme Court ruling	Primarily qualitative relationships	Primarily nonmonetary information	Primarily observed impacts	Domestic	Non-incremental	Distribution	Lowest
	U.S. 9th Circuit Court ruling				Ambiguous	Incremental		
	New facility approval*				Ambiguous	Incremental		
<i>Determining if there is a threat that justifies regulation</i>	EPA endangerment ruling	increasingly quantitative	increasingly monetary	increasingly future	Domestic	Non-incremental	Distribution	↓
	California GHG waiver request				Domestic	Non-incremental		
	Threatened species listing of the polar bear				Global**	Non-incremental		
<i>Evaluating a predefined policy</i>	Twenty-in-Ten	quantitative	monetary	future	Global**	Incremental	Distribution	↓
	Renewable Fuels Standard				Global**	Incremental		
<i>Mandating a pathway for emissions</i>	Clean Air Act	qualitative	monetary	looking	Global**	Ambiguous	Distribution	↓
	Legislative proposals				Global**	Non-incremental		
	International negotiations				Global**	Non-incremental		
<i>Setting a technological standard</i>	CAFE standards	Quantitative relationships	Monetary information	Projected impacts	Global**	Incremental	Point	Highest
	Appliance efficiency standards				Global**	Incremental		

Rose (2010)

Non-monetary metrics essential to more comprehensively characterize risk



Climate variables proxy for all impacts (monetized, quantified, yet to be quantified, difficult to quantify)

Does the right tail shift more than the left?

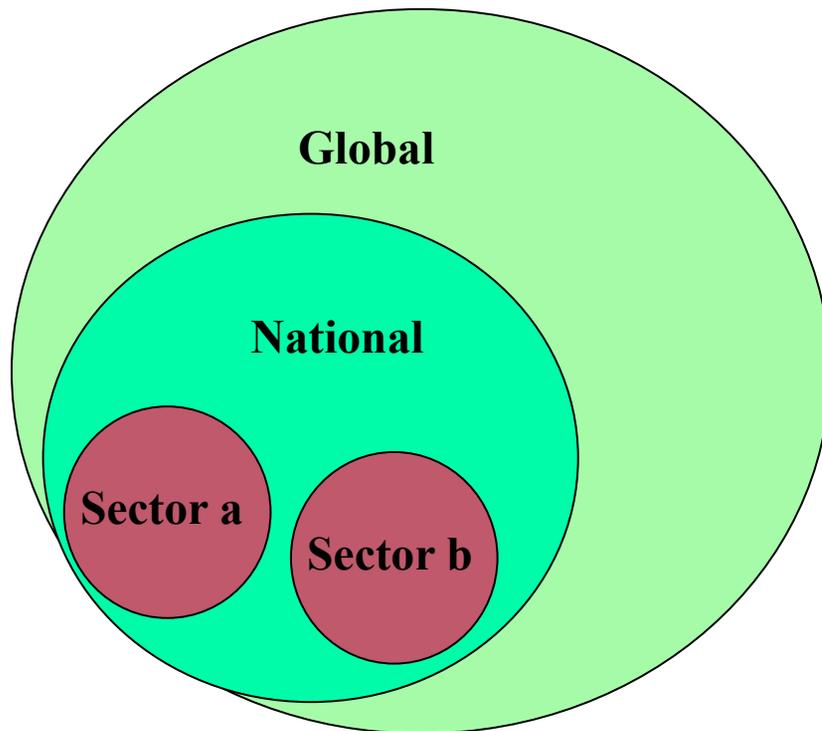
E.g., for a 1% annual global CO₂ reduction

Climate Sensitivity	<i>Leftward shifts relative to that with CS=1.5</i>		
	2030	2050	2100
2	1.2	1.2	1.2
2.5	1.3	1.4	1.5
3	1.4	1.5	1.7
4.5	1.7	1.8	2.1
6	1.8	2.0	2.4

Rose (2010)

Multi-scale and sector (& metric) modeling essential

Complementary & Linked Tools (non-monetary & monetary)!



National & global policy questions require different levels of geographic, biophysical, & economic detail

Large models calibrate to detailed models and then provide context & changes in scale effects relevant to detailed modeling

Coordination crucial! Common assumptions, connecting to the literature (SRES, RCPs, beyond). Natl & international assessment.

Reference

- Rose, S., 2010. “Federal decision-making on the uncertain impacts of climate change: incremental vs. non-incremental climate decisions,” Pew Center on Global Climate Change,
<http://www.pewclimate.org/publications/report/workshop-proceedings-assessing-benefits-avoided-climate-change>.