Informing Climate Policy Given Incommensurable Benefits Estimates

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OECD Workshop
The Benefits of Climate Policy
12-13 December 2002

Outline

- What policy uses for benefit estimates?
  - Current mitigation effort
  - Long-term climate goal
- The limits to economic estimation
  - Incommensurable measures
- What to do?
  - A 3-level portfolio by level, region, metric

Limiting My Scope

- "Benefits" ≡ (net) climate damage avoided by emissions mitigation
- So, important is uses are left out
  - Ancillary benefits
  - Broader issues of sustainable development
- No priorities for specific impact aras needing research (e.g., identify "gaps")
  - But argue for more effort

What Uses for "Framework"?

- Stir public interest & concern
- Guide adaptation at regional level
- "facilitate goal setting for international policies" . . . which requires that they be
  - Widely understood
  - Accepted by diverse parties to domestic decision and international negotiations
  - Robust, for long-term use

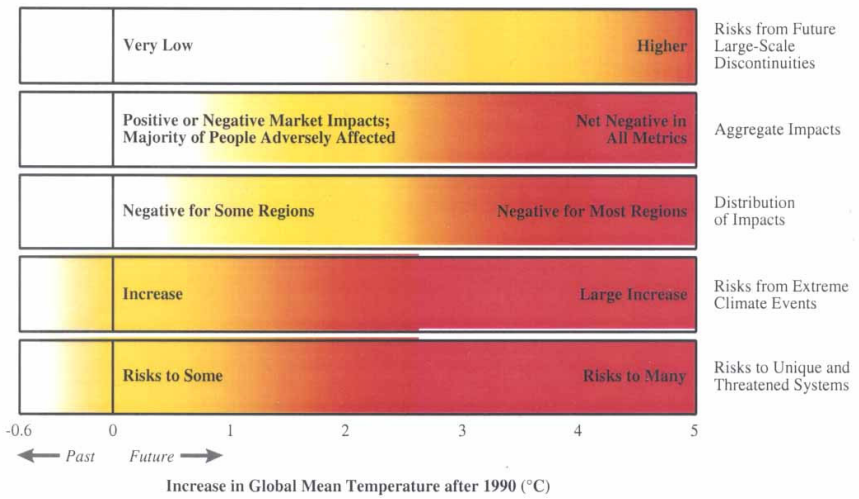
Use? Inform Current Effort

- Current mitigation effort is the most important question
- B/C is always implicit in any solution
- Sometimes B/C is explicit, usually with
  - Single benefit function, usually $ = f(ΔT)
  - Calculation of a path, with focus on the first period
  - Solution in ton CO_2/yr or $/ton

Use? Guide Atmos. Target

- FCCC's facilitating myth: a "danger" level
- Fold back to current effort by
  - Cost-effectiveness analysis (➔ meta B/C)
  - FCCC review of "adequacy of efforts" and tolerable windows analysis
- ➔ desire for a marginal benefit relation
- Two efforts at expression
  - IPCC
  - Smith and Hitz

The IPCC's Impact Summary



Why Incommensurable?

~ Uncertainty

$ Non-market effects

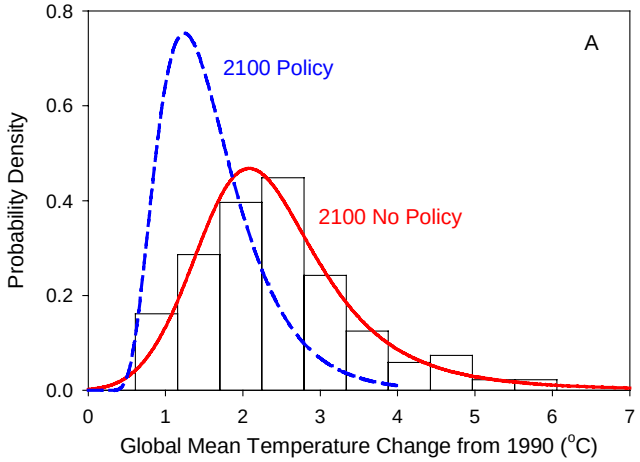
\+ Aggregation

Why Incommensurable?

Uncertainty & Risk Preference

- Daunting series of uncertainties
  - No single-valued link between concentration and climate—only a probabilistic one
  - At continental scale and below, climate uncertainties increase
  - Ecosystem impacts are even less understood
- Differences in risk perception across relevant users of any benefit framework
- How to sum all this to one commonly-accepted measure of (marginal) benefit?

Temperature Change Under No Policy and 550 ppmv Stabilization



Adapted from Webster et al., 2002. MIT Joint Program on the Science and Policy of Global Change, Report #95.

Why Incommensurable?
Value of Non-Market Impacts

- Market-based methods
  - Where market prices exist (important)
  - Revealed preference methods apply (limited)
- Non-market valuation
  - Concepts OK (WTP, WTA, use, option, existence)
  - "Constructed market" methods controversial
  - Scale, time overwhelm empirical methods
- Estimates will be incommensurable

Why Incommensurable?
Aggregation

- Arises at all levels in economic analysis
- Particularly troubling for climate, e.g.,
  - WTP = f(income)
  - People not at the table
- Different parties will impose different weights in global construction
  - ➔➔ Dispute
  - Non-comparable estimates

A Possible Framework: A Cascade of Benefits Measures

- Insights from benefit "shapes" alone
  - Absolute global benefit values problematic
  - NPV & Hotelling insights nonetheless useful
- **Atmospheric targets: a cascade of detail**
  - **Global physical variables, with uncertainty**
  - **Effects at regional scale, mainly natural units**
  - **Non-market valuation and aggregation**
- Informing current choice: the long chain

1. Global Physical Variables With Uncertainty

- Cast the issue in risk reduction terms
  - Expand individual benefit studies
- Global variables in natural units
  - Temperature, perhaps by latitude
  - Sea Level, etc.
- Free of valuation & agg. controversies
- Research on estimation/communication

[What to do with abrupt change?]

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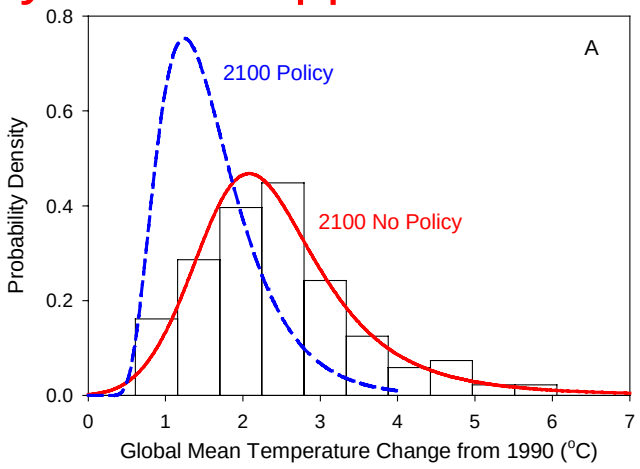

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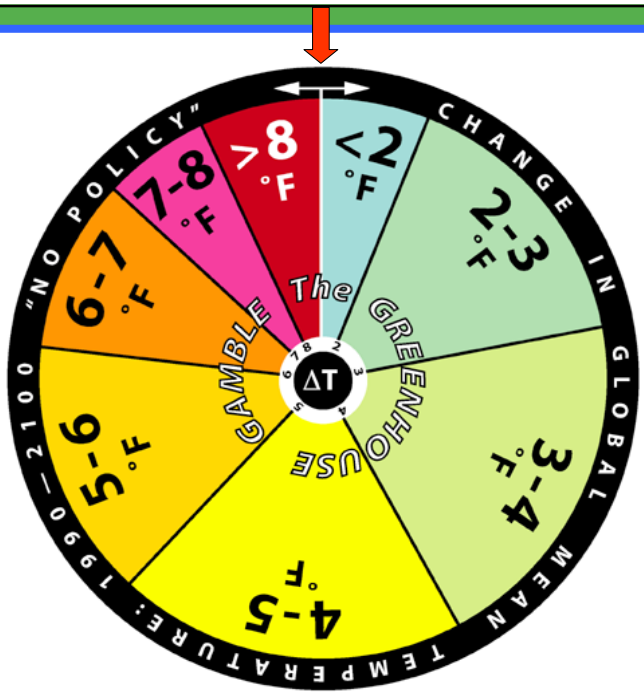

2. Effects at Regional Scale

- Market-based estimates where supported
- Physical measures of non-market impacts
- Re-think regional aggregation
- Few indices with high information content
  - Definition
  - Independence
  - Global application
  - Basis for comparison

E.g.,
Biogeography
Human disruption

3. Non-Market Valuation and Global Aggregation

- Valuation to proceed as methods and data allow
- Aggregation then is in the hands of individual players, but with clarity about different weights and methods

Informing Short-Term Effort: (The long chain)

- A country-level issue: benefits depend on global negotiations
- Stock pollutant problem: benefits depend on actions of future generations
  - Whose options depend on current action
- "Shape" calculations, NPV/TWA can help
- Limited ability of analysis to narrow decision about current effort

Semi-Final Thoughts

- Most of this "framework" is not new. Parts are under way one place or another
- But, suggest a more formal structuring of climate impacts work according to
  - Level of detail methods/data will support
  - Region
- A research task

Conclusion and a Question

- For people in the policy process:
  - Abandon the notion that simple, clear, widely-accepted benefits estimates are to be had
  - Get about organizing incommensurable estimates in the most helpful structure
- If taken seriously, who does it?
  - The IPCC?
  - National, EU research programs?