How to Make Climate Change Research Relevant to Washington policymakers

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Exactly 10 years ago this summer
(while I was in the Clinton Administration)

- The White House released our Administration Economic Analysis, justifying Kyoto policy to an inquisitive Congress by means of economic models, particularly the SGM.
- I presented it to the Snowmass group.
- I wrote "What Kind of Research on Climate Change Economics Would Be of Greatest Use to Policy-makers?"

My 1998 list

of 10 things modelers needed to pay attention to:

1. The Kyoto framework of quantitative emission limits
2. 5 or 10-year intervals
3. International emission permit trading
4. Including all 6 gases, + sinks.
5. Participation by developing countries
6. Implications of a safety valve
7. Uncertainties
8. Endogenize technological process
9. Focus on price effects of Kyoto path
10. Make experiments' assumptions explicit

1. The framework of quantitative emission limits at the national level – as agreed at Kyoto under the UNFCCC

- -- is the institutional framework we have,
- whatever the economic merits of alternatives, for example, a global carbon tax.
- Events have shown quantitative targets to be less unrealistic internationally – less of a perceived intrusion on national sovereignty – than harmonization of instruments (global carbon tax).
- That does not rule out additional features in post-Kyoto successor regimes
  - such as a safety valve or
  - rules for border penalties against non-members.

2. 5 or 10-year intervals

- whereas most models of that time looked solely at much longer-term horizons
  - which is only natural if one is coming from the science,
  - but is of course much less relevant to a politician who will be out of office in 5 years, let alone 50.
- At the same time, politicians seldom want to talk about numbers for the COMING five years.
  - They want to talk about how 15 years from now they will be back to levels of 1990 or 2005,
  - not about the short-term date when emissions would have to peak.

3. The importance of international trading of emission permits
(which many models couldn't accommodate then)

- the resistance to it among the Europeans,
- and the value of analysis of consequences of quantitative limits on trading.
- Also institutions of trading: such as transactions costs, liability issues (buyer vs. seller),
  - though I noted the place for these issues was not a large model.

Other flexibility mechanisms

- 4. Don't focus exclusively on carbon dioxide.
  - We need some models that include all six gases, and as sinks as well.
- 5. Participation by developing countries is the key issue, of course:
  - competitiveness, leakage
  - How to get them in, and how to set targets for them..

Other points

- 6. Implications of a Safety valve or escape clause.
- 7. Uncertainties
  - over what is the proper discount rate,
  - risk aversion, and
  - probability of catastrophe,
  - then – & now – convinced me the usual cost-benefit approach is not necessarily the way to go in this case.
- 8. Need to endogenize technological process fully (e.g. AEEI) with respect to price/policy

Pitfalls:

- The danger of techno-optimism –
  - "Technology is the solution" even absent a carbon price change.
  - Bottom-up engineering models vs. top-down economic models;
- Dynamic inconsistency (i.e., lack of credibility) in pre-announced long-term emission target paths.

Integrated Assessment Models (IAMs)

- IAMs are mathematical models that simultaneously estimate environmental benefits of mitigation of climate change and economic costs of reducing emissions of GreenHouse Gases.
- Requires successful collaboration across disciplines – unusual in academia.
- Pioneered by Manne-Richels, Nordhaus, … followed by various other groups around the world
- Brought together, to compare results & techniques, regularly by Weyant's Energy Modeling Forum, of Stanford University & Snowmass.

How IAM results are presented

- 9. I recommend, in reports intended for public consumption, emphasizing effects on the price of carbon (and thence on gas, heating oil & electric power), ahead of the aggregate costs as % of GDP.
  - Tho not the right measure for cost-benefit analysis,
  - price is the politically salient variable:
    - It reflects *distribution* of costs;
    - It is more tangible; and
    - The public may correctly intuit price is a more reliable sufficient statistic for the extent of economic dislocation than is cost in % of GDP.

How results of IAMs are presented, cont.

- 10. I recommend being very explicit about the assumptions of the experiment that is run.
- The public already suspects that one can't trust model results because "they all disagree,"
  - probably in line with the modeler's political priorities (how green).
- The true range of disagreement among models is smaller than policymakers, press, & public assume,
  - provided one compares the results for the same experiment.
  - The Stanford EMF helps a lot here, standardizing experiments.
  - E.g. the costs of achieving Kyoto given target without international trading or developing country participation will of course be very different from the costs with trading.

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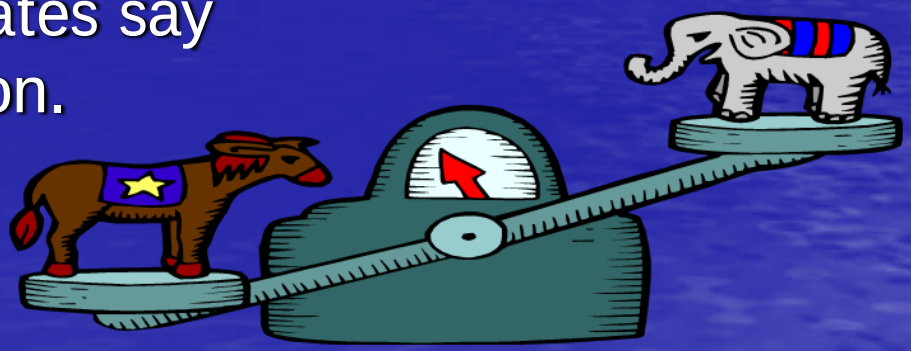
Current State of Play in Washington

- Senate has been pro-action & White House con, the opposite of 10 years ago.
- The good news:
  Interest in / support for climate change policy much higher than 10 years ago.
  - Reasons include accretion of knowledge, & Gore movie
  - Both presidential candidates say they support strong action.



Bills from Lieberman & other Senators…

- 2007-2008 versions did not make it. But the next one might.
- Tax versus tradable permits
  - (and auction vs. grandfathered permits).
  - American politicians don't get it:
    - either the essential equivalence of cap-and-trade to a tax,
    - or the conditions when they differ (uncertainty; the danger that grandfathering permits could mean windfall gains for energy producers.

Senate bills, continued

- Targets (e.g., in Lieberman-Warner)
  - The bills give numbers year-by-year to 2050,
  - Proposal for an independent body of experts, analogous to the Fed, in place of a safety valve. (Wrong-headed idea, in my view).
- Concerns regarding competitiveness and leakage
  - Response: import penalties on countries deemed less green (Frankel, 2008a, & others at June Brookings conference);
    - Need not necessarily conflict with WTO (shrimp-turtle precedent).
    - But likely to be WTO-illegal as written by politicians in practice.
    - US more likely to be the defendant -- victim of border penalties in Europe, which is way ahead of us -- than the prosecutor.

Lieberman-Warner and Bingaman-Spector target paths

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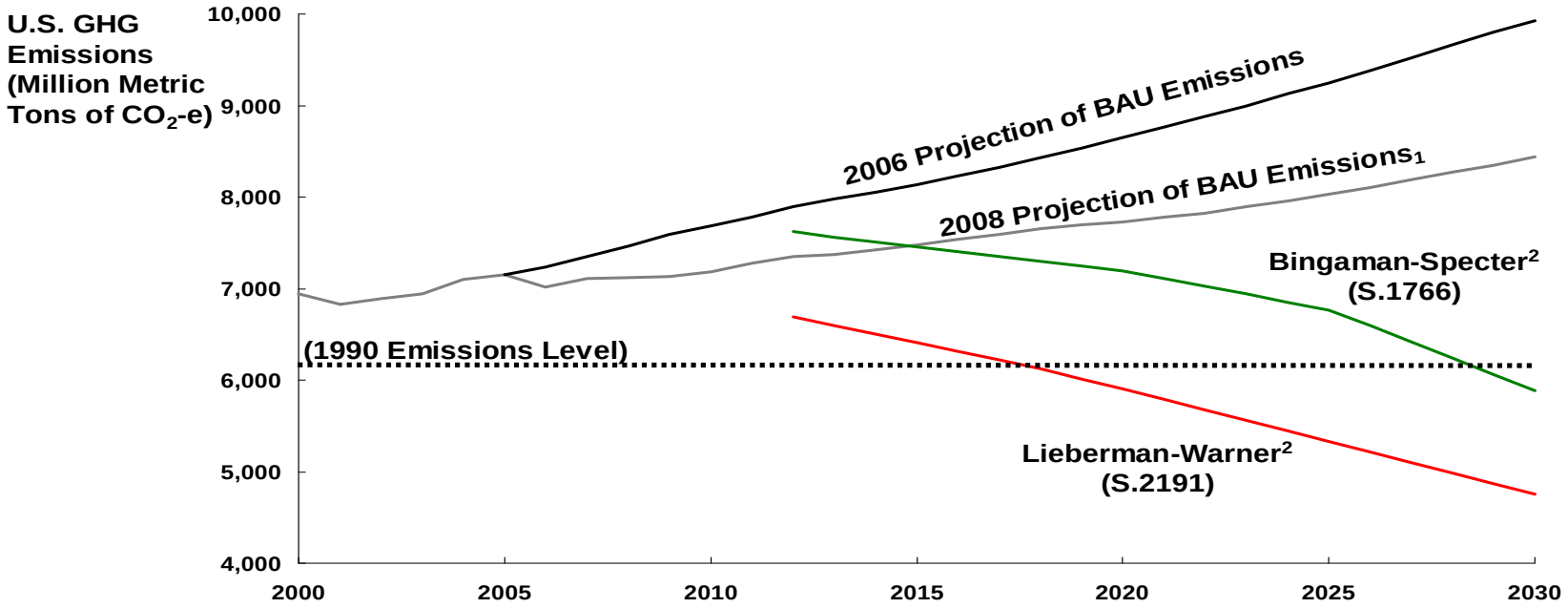
Comparison of Projected Business-as-Usual U.S. Emissions and Emissions Targets in Two Prominent Congressional Proposals



Notes:
1. Reduction in projected emissions reflects impacts of higher fuel prices, and impacts of the Energy Independence and Security Act of 2007 (including, for example, new fuel economy standards).
2. Lines reflect the level of emissions caps proposed by the legislation, and business-as-usual growth in those emissions that would not be capped by the legislation.

Source: U.S. Department of Energy, Energy Information Administration

Questions

- For climate scientists:
  Please put numbers on probabilities and severity of catastrophe scenarios,
  - though rough & subjective
  - Would be more useful than the debate over the discount rate (Stern report, & others, vs. majority of economics: Nordhaus, & others.)

- For land use specialists:
  Are ethanol subsidies good or bad?

Recent wrong turns

- Subsidies for corn-based ethanol
- "We need to get oil prices down" (!)
  - Cause for reflection: increase in price of energy has been far greater than what we contemplated as being either necessary or politically thinkable.
  - Our leaders pander to demands that the government intervene to cut energy prices, while they preach the need for action on GCC.
  - McCain's summer gas tax holiday is one example,
  - Stunning for what it says about the lack of comprehension of the issues (or about hypocrisy)

My own policy conclusion:

- Adopting a variable national tax to put a floor under gas or fossil fuel prices,
  - with national security included as a motivation,
  - especially in reaction to some big new setback,
  - and with revenue conspicuously used to good purpose, such as cutting payroll tax,
- would be easier politically than enacting a tax that would raise the price.

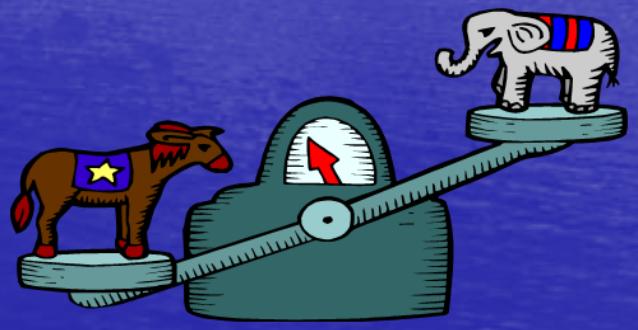
Add to previous list of what attributes are needed from models

- Whereas Congress in 1998 wasn't ready to think about paths that stretched to 2050, let alone 2100, now it is.
  - But need to model lack of credibility of long-term announcements (dynamically inconsistent commitments). Frankel (2008b) is a start.
- To be fully international is even more crucial now:
  - All regions.
  - Able to handle:
    - competitiveness, leakage
      - physical relocation of plants,
      - shrinkage of carbon-intensive sector in some countries vs. others,
      - effects of lower prices of oil & coal (higher natural gas) globally.
    - permit trades, and
    - existence of permit markets with different degrees of quality

3 papers of mine

HARVARD Kennedy School
JOHN F. KENNEDY SCHOOL OF GOVERNMENT

- 1998, **"What Kind of Research on Climate Change Economics Would of Greatest Use to Policy-Makers?"** *Climate Change and Economic Modeling: Background Analysis for the Kyoto Protocol,* OECD, Paris.
- 2008a, **"Addressing the Leakage/Competitiveness Issues In Climate Change Policy Proposals,"** *Climate Change, Trade and Investment: Is a Collision Inevitable?,* Brookings Institution, DC, June, directed by Lael Brainard.
- 2008b, **"An Elaborated Proposal For Global Climate Policy Architecture: Specific Formulas and Targets for Emissions of All Countries in All Decades**" July. *Harvard Project on International Climate Agreements*, directed by Joe Aldy & Rob Stavins, Cambridge.

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