

U.S. Economic and Environmental Modeling Issues

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Brazil-US Economic and Environmental
Modeling Workshop

Rio de Janeiro

March 19-20, 2001

EPA Technical Cooperation on Climate Change

- EPA and other Agencies support a range of climate Change technical cooperation programs with developing countries
 - Technology cooperation
 - Integrated Environmental Strategies with multiple benefits
 - Economic and environmental modeling expert cooperation

Economic Modeling Expert Cooperation -- Goals

- Enhance cooperation among technical experts internationally
- Exchange information and improve understanding of analysis tools and results
- Encourage cooperation to improve methods
- Informal opportunities to compare results and discuss implications

Some Experience for China and Korea

- Fostered improved communication and collaboration among modelers within countries
- Identified several opportunities for cooperation among experts and ongoing programs in different countries
- Developed mechanisms for continuing and enhancing cooperation

What the Expert Workshop will not cover

- Explanation of US Climate Policy
- Debate over specific climate negotiations issues
- Basic research/model development support

Goals for This Workshop

- Better understanding of key models, institutions, and ongoing work in both countries
- Opportunity for individual experts to establish/enhance working relationships with international counterparts
- Develop ideas for possible follow on actions to be considered by US and Brazilian Partners.

Appendix C-1



Brazil-U.S. Economic and Environmental Modeling Workshop

March 19th-20th

Dr. Michael Shelby

Why We Are Here?



- ⊗ Climate change is likely to be a serious worldwide problem over the next century and the solutions to climate change will involve a worldwide response
- ⊗ Both Brazil and the U.S. will have roles to play in solving the problem
 - ⊖ Clearly, the U.S. with 25% of greenhouse emissions today will be involved in initial and continuing efforts to solve the problem
 - ⊖ Brazil as a leader of the developing countries and with its extensive forests will be involved in any global solution as well

Why Are We Here?

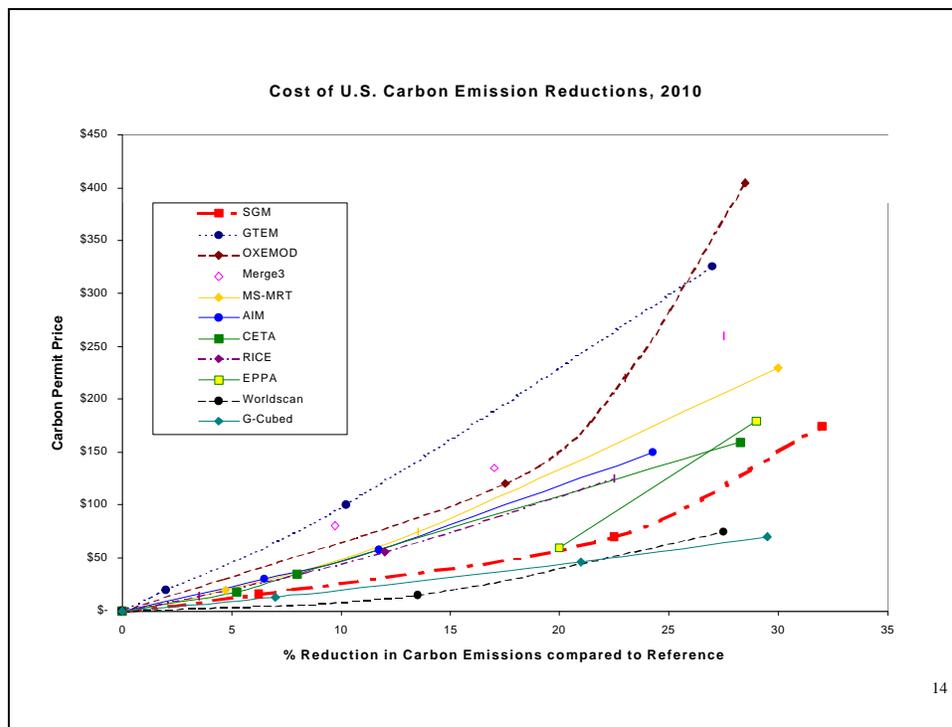
- ⊗ Solutions to the climate problem are complex compared to many other environmental problems
 - ⊖ solutions will be global in nature
 - ⊖ need to use policy instruments that achieve desired objective at least cost (accounting for equity considerations)
- ⊗ Since many gases contribute to climate change, a multi-gas framework will be required
- ⊗ both mitigation of greenhouse gases and increasing carbon sequestration will likely be important components of any international strategy
- ⊗ Both changes in behavior and new technologies will be required
 - ⊖ low/no emitting technologies will be needed in long run

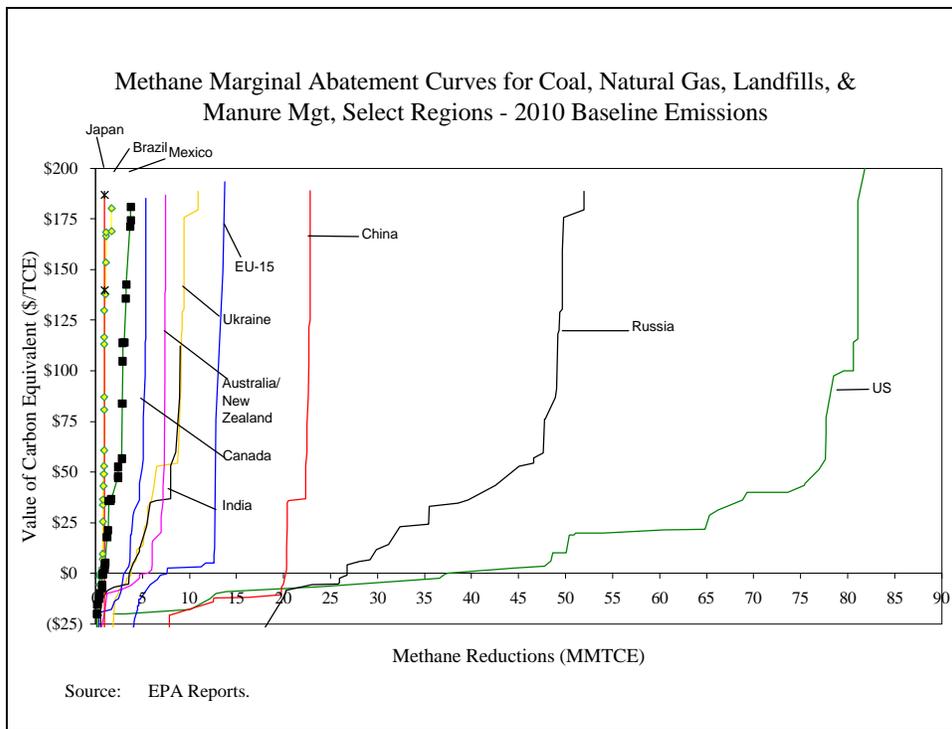
Role of Economic Modeling

- ⊗ Economic modeling can make significant contributions to the design of climate solutions
- ⊗ Economic modeling can look at the feasibility and likelihood of achieving a policy goal
- ⊗ Economic modeling can point out ways to achieving a climate objective at least cost
 - ⊖ from an economists' perspective, this means restructuring incentives so that economic actors are energized to achieve the policy goal
- ⊗ Economic modeling can address the question of "who pays" for various policy options so that policies can be designed to achieve an equitable solution

U.S. Economic Analyses

- ⊖ The U.S. has an on-going extensive economic analytical effort to answer the many questions that need to be answered
- ⊖ A variety of questions need to be addressed:
 - ⊖ what are the global and economy-wide ramifications of alternative approaches to reducing greenhouse gas emissions? (see chart)
 - ⊖ how feasible is to accelerate the deployment of technologies that encourage energy efficiency and no/low greenhouse gas emitting technologies?
 - ⊖ how do biological carbon sequestration strategies (e.g., tree-planting, avoiding deforestation and sequestration of carbon in soils) work and what do they cost?
 - ⊖ What are potential research and development strategies?
 - ⊖ How will international trading of emissions credits work?
 - ⊖ What are the “co-control” benefits (e.g., reduced air pollution) from climate policies?

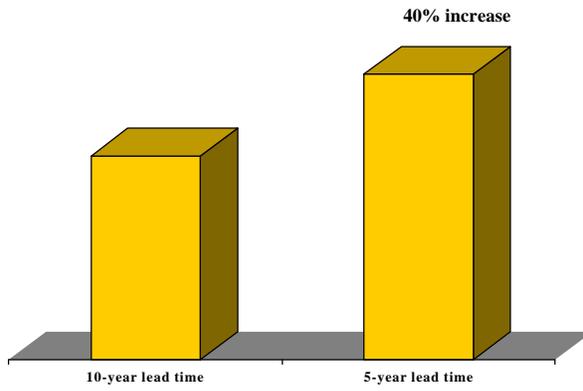




Common Predictions from Economic Modeling

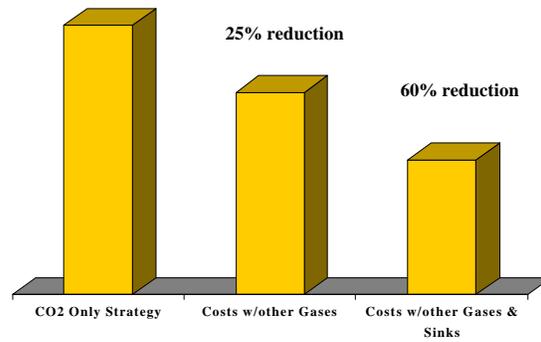
- ⊗ Flexibility in the design of greenhouse gas mitigation strategies can significantly lower costs
 - ⊖ “when” flexibility: when to time the control program
 - ⊖ “what” flexibility: what to target when designing a strategy
 - ⊖ “where” flexibility: where to achieve emissions reductions
- ⊗ To the extent that new technologies can be deployed more rapidly that abate greenhouse gas emissions, costs will be lower as well
- ⊗ Co-control (e.g., air pollution benefits) of climate policies can lower climate mitigation costs, sometimes substantially

"When" Flexibility



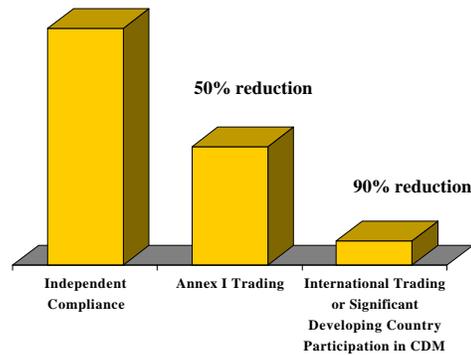
Costs of Achieving a Climate Goal

"What" Flexibility



Costs of Achieving a Climate Goal

"Where" Flexibility



Costs of Achieving a Climate Goal

Cooperation with Brazil is Important to the U.S.

- ⊗ In order for the U.S. to better analyze climate options, we need to understand worldwide trends and options to mitigate emissions
 - ⊖ for example, one model (of many) used in the U.S. to assess climate strategies is the Second Generation Model (Battelle)
 - ⊖ being a global model, we currently have very crude approximations of how the Brazilian economy works and how it fits into the global picture
 - ⊖ we are currently working with Brazilian experts to incorporate a Brazilian "module" into the Second Generation Model
- ⊗ collaboration between the U.S. and Brazil should have numerous advantages for both Brazil and the U.S.