

## **Final Progress Report**

### **2008 Award**

Report submitted 091105

### **Project Title: Climate Change Policy as Sustainable Development: Designing a Successor to Kyoto that Brings Developing Countries Inside Without Derailing Growth**

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#### Project abstract

The research deals with global climate change policy as it relates to developing countries. Sustainable development in this context means achieving the twin goals of protecting the global environment and allowing poor countries to achieve economic development. The absence of serious commitments by developing countries is one of the most intractable shortcomings of the Kyoto Protocol on Global Climate Change.

Developing countries must participate, for three reasons.

(1) They will be the source of the big increases in emissions in coming years according to the Business-as-Usual path (BAU), that is, the path along which countries' emissions would increase in the absence of an agreement.

(2) If a quantitative international regime is implemented without the developing countries, their emissions are likely to rise even faster than the BAU path, due to the problem of *leakage*.

(3) The opportunity for industrialized countries to buy relatively low-cost emissions abatement from developing countries is crucial to keep the economic cost low.

The developing countries point out that it was the industrialized countries, not they, who created the problem, and they should not be asked to limit their economic development to pay for it. Developing countries argue that equity requires setting quantitative targets at equal amounts per capita. But the rich countries will not accept this.

Grant-supported research falls under three topics: Project 1 sought to formalize a proposal for successors to the Kyoto Protocol that set quantitative emission targets in such a way as to bring developing countries inside the system. Project 2 explored the increasingly-likely prospect that rich countries would apply border taxes against energy-intensive imports from developing countries that do not participate. Project 3 investigates the implications of uncertainty for developing countries, and seeks to make

the long-term regime robust with respect to economic fluctuations by sequentially indexing their targets.

In addition, briefly describe:

1) How the project has advanced research promoting sustainable development in the developing world:

The project has demonstrated that it is possible to pick a path through the minefield to attain a sequence of targets for greenhouse gas emissions that will be sustainable environmentally, economically, and politically. The three biggest mines in the minefield are: (i) possible failure to achieve substantial reductions in global emission, (ii) asking developing countries for sacrifices that they see as incompatible with their economic development, (iii) setting emissions targets by which countries ultimately refuse to abide.

2) The project's intellectual merit:

The contribution that would probably best meet the criterion of publication in a refereed economic journal is the econometric estimation of whether trade and growth are good or bad for environmental goals. The latest version of these estimates appears in the Sweden paper, which was published as a monograph in January 2009.

The most important overall contribution of the project is probably the design of the framework of formulas for emission targets and the simulation of their economic and environmental implications. On the targets project, I have been collaborating with Valentina Bosetti of FEEM in Milan. (Italy is not a developing country; but it is the source of the funding for the Sustainability Science program.) We have succeeded in constructing a sequence of formulas, and particular parameter values for the formulas, that (i) achieve the GHG concentrations goal (a big first step to environmental sustainability), while simultaneously (ii) ensuring that there is no leakage from rich to poor countries and that no poor countries are asked to make economic sacrifices different in nature from those made before them (thus satisfying the constraints of political and economic sustainability). Designing a solution to meet the political constraints demanded by both the United States and developing countries has been a rewarding exercise even on strictly intellectual grounds. (The central paper is: "An Elaborated Proposal for Global Climate Policy Architecture: Specific Formulas and Emission Targets for All Countries in All Decades;" full citation given below. More recently, we have just finished a successor paper that attempts to attain more ambitious environmental targets.)

3) How the project has contributed to solving a practical problem of sustainable development:

The previous paragraph is probably the answer to this question as well. People in official policy circles are being influenced by the proposal in my central paper. I expect to go to Copenhagen in December and to present the results to those assembled at the

negotiations of the Conference of Parties of the UN Framework Convention on Climate Change.

4) Any developing world component, including field work, engaging a co-investigator or practitioner from the developing world, the development of institutional links with an academic or practitioner/ applications/ problem-solving oriented institution in the developing world:

(i) Met with the Energy Minister of Costa Rica, to discuss their hopes of becoming carbon neutral, May 16, 2008.

(ii) Wrote a memo to President Felipe Calderon of Mexico, a former student of mine, titled "Possible Impacts of Global Climate Change Policy on Mexico and other Developing Countries in Coming Years," revised January 2009. President Calderon had to cancel plans for a scheduled in-person meeting at the World Economic Forum in Mexico in 2008, but it might still take place in the future.

(iii) Traveled to Mauritius in January 2009.  
Visited a sugar plantation, and saw bagasse and the machinery that it powers.  
Discussed with national leaders and local academics the failure to implement plans to reduce traffic congestion in the capital city.

(iv) More recently, have discussed my results with the Environmental Ministers and trade negotiators of the European Union, India, and Singapore. I presented the results at a speech and dinner for national ambassadors to the WTO (including from China and Singapore) in Geneva, in June 2009.

5) The engagement of a student or research fellow in the project and whether the project has provided any opportunities for a thesis or masters student exercise:

A student (Master in Public Administration in International Development), Diva Singh, acted as my assistant on the Mauritius expedition and wrote her masters thesis on food security issues in Indian Ocean countries, along with another student of mine.

6) Any funds leveraged as a result of this project:

The Mauritius trip was funded from a different grant.  
The same with the conferences in Snowmass, San Francisco and Stockholm (see below).  
Co-author Bosetti was funded by the Climate Impacts and Policy Division of the EuroMediterranean Center on Climate Change (CMCC).

7) Reports, papers, publications or presentations building on this support (please list full citations here and attach copies or URL's if possible):

Most relevant to this grant --

### **Project 1:**

"An Elaborated Proposal for Global Climate Policy Architecture: Specific Formulas and Emission Targets for All Countries in All Decades," Chapter 2 in *Post-Kyoto International Climate Policy*, edited by Joe Aldy and Rob Stavins (Cambridge University Press, 2009). HPICA Discussion Paper 08-08. NBER WP 18476, April 2009.

Also available at

<http://ksghome.harvard.edu/~jfrankel/currentpubsspeeches.htm#On%20Climate%20Change>: slides; p.

"Global Climate Policy Architecture and Political Feasibility: Specific Formulas and Emission Targets to Attain 460PPM CO2 Concentrations" (with Valentina Bosetti), September 2009. HPICA Disc.Paper 09-30. NBER Working Paper, November 2009.

### **Project 2:**

"Environmental Effects of International Trade," A Report for the Swedish Globalisation Council (Government of Sweden, Stockholm), 2009. RWP 09-006, Harvard KS, January 2009.

"Global Environmental Policy and Global Trade Policy," in *Post-Kyoto International Climate Policy*, edited by Joe Aldy and Rob Stavins (Cambridge University Press, 2009). RWP08-058. HPICA paper no.08-14, Oct. 2008.

[Policy summary available at

<http://ksghome.harvard.edu/~jfrankel/currentpubsspeeches.htm#On%20Climate%20Change>. ]

Press coverage: "Study: Kyoto Protocol, Free Trade Compatible -- Harvard professor reconciles free trade and ecological responsibility," *Harvard Crimson*, Nov. 05, 2008; *Wall Street Journal*, Jan. 30, 2009.

"Addressing the Leakage/Competitiveness Issue In Climate Change Policy Proposals," in *Climate Change, Trade and Investment: Is a Collision Inevitable?* (Brookings Institution Press, Washington, DC, 2009), edited by Lael Brainard and Isaac Sorokin: 69-91.

[Related blogpost Sept. 9, 2008, at

[http://content.ksg.harvard.edu/blog/jeff\\_frankels\\_weblog/2008/09/02/anti-shirking-import-penalties-in-us-climate-change-bills-could-backfire/](http://content.ksg.harvard.edu/blog/jeff_frankels_weblog/2008/09/02/anti-shirking-import-penalties-in-us-climate-change-bills-could-backfire/) ]

### **Other recent writings on energy and global climate change policy:**

"Comments on 'Credibility, Commitment and Regulation,'" *Populism and Natural Resources*, edited by Bill Hogan and Federico Sturzenegger (forthcoming, Fall 2009, MIT Press).

"Energy and the Environment: Policy Advice for the New Administration: The matrix," AEA/AERE meetings, San Francisco, Jan. 2009.

[Related blogposts May 18, 2008, July 15, 2008, Nov. 4, 2008, and Jan. 20, 2009, at [http://content.ksg.harvard.edu/blog/jeff\\_frankels\\_weblog/2008/05/08/how-far-the-nyt-had-to-go-to-find-an-economist-to-support-the-gas-tax-holiday/](http://content.ksg.harvard.edu/blog/jeff_frankels_weblog/2008/05/08/how-far-the-nyt-had-to-go-to-find-an-economist-to-support-the-gas-tax-holiday/) ;

[http://content.ksg.harvard.edu/blog/jeff\\_frankels\\_weblog/2008/07/15/offshoring-is-a-more-dubious-policy-when-the-question-is-oil-drilling/](http://content.ksg.harvard.edu/blog/jeff_frankels_weblog/2008/07/15/offshoring-is-a-more-dubious-policy-when-the-question-is-oil-drilling/) ;  
[http://content.ksg.harvard.edu/blog/jeff\\_frankels\\_weblog/2008/11/04/a-few-tax-policy-suggestions-for-our-new-president/](http://content.ksg.harvard.edu/blog/jeff_frankels_weblog/2008/11/04/a-few-tax-policy-suggestions-for-our-new-president/); and  
[http://content.ksg.harvard.edu/blog/jeff\\_frankels\\_weblog/2009/01/20/advice-for-the-new-administration-spend-green-today-tax-green-in-the-future/](http://content.ksg.harvard.edu/blog/jeff_frankels_weblog/2009/01/20/advice-for-the-new-administration-spend-green-today-tax-green-in-the-future/) , respectively.]

“How to Make Climate Change Research Relevant to Washington policymakers,”  
Energy Modeling Forum *Workshop on Climate Change Impacts and Integrated  
Assessment*, Snowmass, Colorado, July 31-Aug. 1, 2008.

[Related blogpost Aug. 23, 2008, at

[http://content.ksg.harvard.edu/blog/jeff\\_frankels\\_weblog/2008/08/23/serious-research-balances-economic-costs-environmental-benefits-of-climate-policy/](http://content.ksg.harvard.edu/blog/jeff_frankels_weblog/2008/08/23/serious-research-balances-economic-costs-environmental-benefits-of-climate-policy/) .

### **Other outreach and press coverage:**

"Last Exit Copenhagen?" *Climate Governance Workshop*, The Goethe-Institut Boston & Center for European Studies, Oct. 20, 2009 .

"A Pragmatic Global Climate Policy Architecture," (with V. Bosetti), forthcoming in *100 Policy Commentaries on Environmental, Energy, Urban and Public Health Problems*, Ian Parry and Felicia Day (Resources for the Future: Washington).

"The politically possible: How to achieve success in Copenhagen," *Bulletin of the Atomic Scientists*, October 2009.

"Trade and the Environment," *Thinking Ahead on International Trade*, Geneva, June 18, 2009.

"Trade, Growth, and the Environment," guest lecture in R.Stavins' class in Environmental & Resource Economics and Policy, 2008, April 2009.

"The Global Climate Regime and the Global Trade Regime," for Regulatory Policy Program Seminar, March 20, 2008. Harvard University.

"How to set greenhouse gas emission targets for all countries," Vox, July 18, 2009. Blogpost July 21, 2009.

"US academics call for GHG emission targets for all countries," *LowCarbonEconomy*, July 22, 2009.

"International Trade and the Environment: Ever the Twain Shall Meet?" *Impact*, HKS, Spring 2009

"Trade Offs: When Climate Policy Clashes With Trade Policy," *Wall Street Journal*, Jan.30, 2009.

"Study: Kyoto Protocol, Free Trade Compatible -- Harvard professor reconciles free trade and ecological responsibility," *Harvard Crimson*, Nov. 5, 2008.

"Kyoto Protocol and World Trade Organization on a "collision course." *HKS news*, Nov.3, 2008.

“Prof. Jeffrey Frankel Cites Need to Balance Trade Benefits with Environmental Protection,” *HKS News*, March 20, 2008.

8) Discussion of any significant deviations from the proposed work plan:

We have now produced a set of parameter values in the emissions formula framework that can produce a somewhat more aggressive concentration target of 460 PPM in the year 2100. But we have not yet proceeded, we hope in the coming year to proceed to the third component of the work program, having to do with uncertainty.

9) Visual aids (If you have any photographs or graphics that we can use to promote your work we'd appreciate your sharing them with us.)

Photos of some of the author's presentations are available at:

<http://ksghome.harvard.edu/~jfrankel/GEI.htm> ;

<http://ksghome.harvard.edu/~jfrankel/JFtrade+envLectCBG08.jpg> ;

and

<http://ksghome.harvard.edu/~jfrankel/currentpubsspeeches.htm#Trade%20and%20Climate%20Change>.

Lots of files of powerpoint presentations are available at the website.

10) Website address for further information:

My recent writings on Climate Change (including some focused on developing countries, and some on trade) appear at:

<http://ksghome.harvard.edu/~jfrankel/currentpubsspeeches.htm#On%20Climate%20Change> or at <http://ksghome.harvard.edu/~jfrankel/Topicindex.htm>, under Global

Environment