11.S940 CLIMATE ECONOMICS AND POLICY

Fall 2014
Thursday, 2:00 – 5:00
Room 9-450A

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This is an intensive reading and discussion course on current issues in climate economics and policy. The first part of the course introduces the problem and examines the costs of climate damages and the costs of mitigation. The second part explores major economic issues in climate analysis: the paradoxes of intergenerational discounting, the analysis of extreme uncertainty and irreversible risks, and the difficulties in applying cost-benefit analysis. The third part addresses topics in climate policy: the current policy context in the US and China; issues of carbon embedded in trade; carbon prices and markets; global equity concerns; and the state of global negotiations.

This preliminary syllabus (August 15) is subject to revision, particularly in the later weeks of the course. Additional guest speakers have been invited but not yet confirmed.

Assignments will depend on the size of the class. Grades will be based on papers and class participation; there will not be an exam. Introductory economics is a prerequisite for the class. Basic knowledge of climate change will be helpful; see the recommended texts.

**Required text:**
Frank Ackerman, *Can We Afford the Future* (Zed Books, 2009)

**Recommended texts:**
An even shorter summary: Hansen et al., “Assessing dangerous climate change...”

**I: CLIMATE DAMAGES AND MITIGATION**

**Sept 4: Overview of course; introduction to climate damages**
Stern, “The economics of climate change”
Ackerman, “Climate economics in four easy pieces”
Eastin et al., “The two limits debates: ‘Limits to Growth’ and climate change”
*Risky Business* report, [http://riskybusiness.org](http://riskybusiness.org) (chapters on regional impacts are optional)
Recommended
Two short readings on climate denial
  Frazier, “Deniers”
  Can We Afford the Future?, Chapter 6

Sept 11: Damages, continued: US impacts from agriculture, health, storms and sea-level rise
(Largely selections from National Climate Assessment, full report (http://nca2014.globalchange.gov) and from American Climate Prospectus, the background study for Risky Business (http://rhg.com/wp-content/uploads/2014/06/RHG_AmericanClimateProspectus_June2014_LowRes1.pdf)

Agriculture
  Ackerman and Stanton, “Climate impacts on agriculture: A challenge to complacency?”,
  National Climate Assessment (NCA), Chapter 6
  American Climate Prospectus (ACP), Chapter 6

Health
  NCA, Chapter 9
  ACP, Chapter 8
  Recommended: Curreiro et al., “Temperature and Mortality in 11 Cities of the Eastern United States”

Storms and sea-level rise
  NCA, Chapter 2, key messages 8-10
  ACP, Chapter 11

Economic valuation
  ACP, Chapter 13 (parts specific to other damage categories can be skipped)

Sept 18: Costs of mitigation
Peters et al., “The challenge to keep global warming below 2°C”
Mckinsey report, Sections 2-4 (pages 22-45)
Ekins et al., “Marginal abatement cost curves: A call for caution”
Steinhurst and Sabodash, “The Jevons paradox and energy efficiency”
IPCC, AR5, WG3, Chapter 6, Sections 6.3.1 – 6.3.5 (pages 45-55)
Lubowski and Rose, “The potential for REDD+: Key economic modeling insights and issues”
Nemet et al., “Implications of incorporating air-quality co-benefits into climate change policymaking”
Candelise et al., “Dynamics of solar PV costs and prices”
MacKerron, “Costs and economics of geoengineering”

II: ECONOMIC ANALYSIS: THE CHALLENGES OF CLIMATE CHANGE

Sept 25: Discounting and intergenerational ethics
Can We Afford the Future?, Chapters 1-2
Arrow et al., “Intertemporal equity, discounting, and economic efficiency,” Appendix sections 4A.1 and 4A.2 can be skipped.
Arrow et al., “Determining benefits and costs for future generations”
Summers and Zeckhauser, “Policymaking for posterity”
Sterner and Persson, “An even Sterner Review: Introducing relative prices into the discounting debate”
Jeuland, “Social discounting of large dams with climate change uncertainty”

Recommended: Stern Review, appendix to Chapter 2, pages 41-52

Oct 2: Catastrophic risk, decision-making under uncertainty
Can We Afford the Future?, Chapter 3
Lenton et al., “Tipping elements in the Earth’s climate system”
Ackerman and Stanton, “Debating the Dismal Theorem”
Ackerman, “Tipping points and known unknowns”
Stern, “The structure of economic modeling of the potential impacts of climate change”
Pindyck, “The climate policy dilemma”

Recommended:
Ackerman et al., “Epstein-Zin utility in DICE: Is risk aversion irrelevant to climate policy?”
Lenton and Ciscar, “Integrating tipping points into climate impact assessments”

Oct 9: Cost-benefit analysis and valuation; social cost of carbon
Can We Afford the Future?, Chapters 4-5
Ackerman and Heinzerling, “Pricing the priceless: Cost-benefit analysis of environmental protection,”
Sunstein, “Cost-benefit analysis and the environment”
Driesen and Bogojevic, “Economic thought and climate disruption: Neoclassical and economic dynamic approaches in the USA and EU”
Masur and Posner, “Climate regulation and the limits of cost-benefit analysis”
Ackerman and Stanton, “Climate risks and carbon prices: Revising the social cost of carbon”
Van den Bergh and Botzen, “A lower bound to the social cost of CO2 emissions”

Recommended:
Ackerman et al., “Applying cost-benefit to past decisions”
Carlin, response to Ackerman et al.
Ackerman, “The unbearable lightness of regulatory costs”
Ackerman, blog posts on 2013 revision of SCC (http://frankackerman.com/blogs-and-op-eds/, “Secret climate cost calculations: the sequel” and “As good as a stopped clock: the House does transparency”)

Oct 16: Economic modeling, IAMs, Stern Review
Nordhaus, “Integrated economic and climate modeling,” Sections 16.1-16.2 (pages 1069-1094)
Ackerman et al., “Limitations of integrated assessment models of climate change”
Pindyck, “Climate change policy: What do the models tell us?”
Stern Review, Chapter 6, pages 143-165
Nordhaus, “A review of the Stern Review”
Ackerman et al., “Did the Stern Review underestimate US and global damages?”

**Recommended:**
Weitzman on the Stern Review
van Vuuren et al., “How well do integrated assessment models simulate climate change?”
Reilly et al., “Valuing climate impacts in integrated assessment models: The MIT IGSM”

### III: CLIMATE POLICY

#### Oct 23 US climate policies
**Guest speaker:** Liz Stanton, Synapse Energy Economics

Stanton et al., “Implications of EPA’s proposed 111(d) ‘Clean Power Plan’ Rule” (Synapse Energy Economics, forthcoming September 2014)
NRDC Issues Brief, “Cleaner and Cheaper…”
Eisenberg et al., “A state tax approach to regulating greenhouse gases under the Clean Air Act”
Fischer and Fox, “The role of trade and competitiveness measures in US climate policy”
Parry and Krupnick, “Is a clean energy standard a good way to move U.S. climate policy forward?”
Burtraw and Woerman, “Economic ideas for a complex climate policy regime”
Brulle et al., “Shifting public opinion on climate change: an empirical assessment…”
Kotchen et al., “Willingness-to-pay and policy-instrument choice for climate-change policy in the United States”

**Recommended**
Kaswan, “Controlling power plants: The co-pollutant implications of …111(d)…”

#### Oct 30 Climate policy in China; emissions embodied in trade
Czarnezki, “Climate policy & U.S.-China relations”
Li and Wang, “Energy and climate policy in China’s 12th five-year plan”
Yuan et al., “China’s 202 clean energy target…”
Ackerman, “Carbon embedded in China’s trade”
Feng et al., “Outsourcing CO$_2$ within China”
Davis and Caldeira, “Consumption-based accounting of CO$_2$ emissions,”
Andrew et al., “Climate policy and dependence on traded carbon,”
Peters et al., “Growth in emission transfers via international trade from 1990 to 2008”

**Recommended**
Zhang, “Who should bear the cost of China’s carbon emissions embodied in goods for export?”
Sato, “Embodied carbon in trade: a survey of the empirical literature”
Nov 6 Taxes, trading proposals
CTC, “Where carbon is taxed”
Melton and Peters, “Is British Columbia’s carbon tax good for household income?”
Nordhaus, “Carbon taxes to move toward fiscal sustainability”
Tietenberg, “Reflections – carbon pricing in practice”
Goulder and Schein, “Carbon taxes versus cap and trade: A critical review”
Ellerman et al., “The EU ETS: Eight years and counting”
Hibbard and Tierney, “Carbon control and the economy: Economic impacts of RGGI’s first three years”
Zuckerman et al., “Cap and trade in practice: Barriers and opportunities for industrial emissions reductions in California”

Recommended
Koch et al., “Causes of the EU ETS price drop…”
Martin et al., “The impact of the EU ETS on regulated firms…”
Huber, “How did RGGI do it? Political economy and emissions auctions”
Murray et al., “Why have greenhouse emissions in RGGI states declined?…”

Nov 13 Global equity
Baer et al., “The greenhouse development rights framework”
Schleich et al., “Citizens’ perceptions of justice in international climate policy”
Meyer and Roser, “Climate justice and historical emissions”
Tian et al., “Cross country fairness considerations and country implications of alternative approaches to a global emission reduction regime”
Luderer et al., “On the regional distribution of mitigation costs in a global cap-and-trade regime”
Markandya, “Equity and distributional implications of climate change”
Ackerman et al., “Climate policy and development: An economic analysis”

Recommended
Lange et al., “On the self-interested use of equity in international climate negotiations”
Mattoo and Subramanian, “Equity in climate change: An analytical review”

Nov 20 Global negotiations: what next?
Jacoby and Chen, “Expectations for a new climate agreement”
Bosetti and Frankel, “Politically feasible emissions targets to attain 460 ppm CO₂ concentrations”
Metcalf and Weisbach, “Linking policies when tastes differ: Global climate policy in a heterogeneous world”
Schroeder et al., “Equity and state representations in climate negotiations,”
Stewart et al., “A new strategy for global climate protection”
van Asselt and Zelli, “Connect the dots: Managing the fragmentation of global climate governance,”
Smead et al., “A bargaining game analysis of international climate negotiations”
Recommended
Kriegler et al., “What does the 2°C target imply for a global climate agreement in 2020?...”
Zhang and Shi, “From burden-sharing to opportunity-sharing: Unlocking the climate negotiations”

Dec 4 TBA (reserved for additional topics that arise, or additional discussion of any of the above)