

## Climate Change and Clean Energy Policy

DHP P254 Syllabus

Tuesday-Thursday 11:05-12:20 PM

Prof. Barbara Kates-Garnick

The course assistant is **Clara Vandeweerd** and her email is Clara.Vandeweerd@tufts.edu. If you have a question about course content, I encourage you to contact Clara *before* coming to see me. My office hours are on Tuesday from 2 to 3 and Wednesdays from 2:30 to 3:30. An office hours sign-up sheet will be posted at Cabot Suite 509 each week for the following week. If you need to make a separate appointment outside regular office hours' time, please **contact Elayne Stecher** at Elayne.Stecher@tufts.edu to reserve a time on my schedule (Please do not email me to make scheduling requests). Otherwise, the best way to reach me is by email.

### Overview of the Course

How can governments respond to the challenges posed by the complex problem of global climate change? The goal of this course is to give students a thorough and nuanced understanding of the scientific, economic, political and technical challenges faced by climate change policymakers in combating climate change. The primary focus of the course is on *mitigation* through the development and deployment of clean energy technologies, but policy for adaptation is covered as well. The course focuses both on domestic and international policy. The student will also come away from the course with an understanding of the history of international climate change negotiations, an understanding of the challenges in developing an international and domestic climate regime, and the challenges faced by policy makers. In doing all this, the course will also both introduce and strengthen multidisciplinary policy analysis skills.

Briefly, the course is divided into four parts: (1) the science of the causes and impacts of climate change, as well as the economics of climate change and clean energy technologies, (2) a unit on politics and policy, (3) a focus on the global climate change negotiations and the negotiating positions of major emitters including a negotiation simulation, and finally (4) country-by-country case studies in which the domestic and foreign climate policies of major emitting countries are analyzed and evaluated against different criteria.

This class is open to students of every background and discipline, but the professor expects students to be familiar with the basics of microeconomics, macroeconomics, international trade, international relations, and political science.

### Goals for the Course

- Achieve fluency in the language of the climate change field
- Understand how to conduct climate change policy analysis
- Understand the economics of clean energy and climate change
- Understand why the international negotiations on climate change are stymied
- Gain proficiency in interdisciplinary methods

### Assignments and Grading

There are **five** assignments for this course and you will receive detailed instructions for each assignment in due time. But, briefly, there will be two *problem sets*. The first problem set will cover the science of climate change, and the second problem set will cover the economics of climate change policies. Understanding the basic details of both the science and economics of climate change are essential to understanding the complexities of climate change policy. The problem sets will include both quantitative analyses and brief discussion questions. The third assignment is a *policy analysis essay*. In

this essay, you will analyze several climate change policy analyses provided to you, identifying the methodologies employed, and commenting on the strengths and weaknesses of each. Fourth, an in-class *negotiation simulation* of the international negotiations on climate change will be held in November. Each student will receive a slightly different assignment for the simulation. Students should be advised that there will be extra homework during the week of the simulation, and that a short reflection on the simulation must be written by the due-date. Your grade will be based on both your performance in the simulation and your reflection. The final assignment, due on the last day of class, is a short *comparative analysis paper* in which the climate change policies of different countries are compared, contrasted, and analyzed. In addition to these assignments, each student will be expected to participate actively in discussions and exercises, and to demonstrate that he or she has read the homework assignments. For each topic, you will be required to submit a reflection on the readings. These reflections can be written in collaboration with other classmates.

No late assignments will be accepted. Really. If you foresee a conflict, please see me in my office hours at least a month in advance of the due date.

<b>Assignment</b>	<b>Percent of Grade</b>	<b>Due Date</b>
Problem Set 1: Science	9%	September 25 <sup>th</sup>
Problem Set 2: Economics	9%	October 7 <sup>th</sup>
Policy Analysis	18%	October 23 <sup>rd</sup>
Simulation Exercise & Reflection	18%	November 6 <sup>h</sup>
Final Comparative Analysis Paper	30%	December 9 <sup>th</sup>
Reflections	10%	Throughout
Class Participation	6%	Not Applicable

### **An Important Reminder About Citing Sources**

Students must be familiar with and observe Fletcher’s rules regarding the citation of sources. In short: Any sentences or paragraphs taken verbatim from the writing of or interviews with any other person or persons, or from your own writing that has been published elsewhere, must be placed in quotation marks and its source must be identified with a footnote or endnote that includes the usual bibliographic information: author’s name, title of article or chapter, venue (book, journal, magazine, website, report, thesis, term paper, private letter), date, and page numbers if applicable. The inclusion – in assignments, exams, or term papers – of material taken verbatim from other work without the use of quotation marks and citations is regarded, as a matter of School and University policy, as a serious violation of academic and professional standards and can lead to a failing grade in the course, failure to graduate, and even expulsion from the University. Changing the wording of a sentence or passage slightly does not evade the requirement for citation (nor reduce the chance of detection). And, it must be strongly emphasized, material taken from websites is not exempt from the requirement for citation.

## Summary schedule

### **Date            Topic or Assignment**

#### **Part I. Science, economics, and technology**

09/04/14	Climate change science
09/09/14	Key concepts and emissions scenarios
09/11/14	Bridging science, economics and policy (Reflection 1)
09/16/14	Clean energy technologies
09/18/14	Mitigation technology: Stabilization Wedges game (Reflection 2)
09/23/14	Climate Summit 2014
09/25/14	Adaptation (Guest lecture: Laura Kuhl) Problem Set 1 due at beginning of class

#### **Part II. Politics and policy options**

09/30/14	Goals, targets, and criteria for policy
10/02/14	Role of media and public perceptions of climate change (Guest lecture: Larry Carpmann) (Reflection 3)
10/07/14	Domestic policy instruments (Reflection 4) Problem Set 2 due at beginning of class
10/09/14	Market-based instruments
10/14/14	Policy instruments for global climate policy (Reflection 5)
10/16/14	Policies for technological innovation – I (Guest lecture: Peter Rothstein) (Reflection 6)
10/21/14	Policies for “technology transfer” – II
10/23/14	Politics of climate change (Guest lecture: Clara Vandeweerd) Policy Analysis due at beginning of class

#### **Part III. Global climate negotiations**

10/28/14	Global climate change negotiations history
10/30/14	International negotiation simulation – I
11/04/14	International negotiation simulation – II
11/06/14	Reflection of international negotiation simulation and discussion of contemporary issues Negotiation Simulation Reflection Due
11/11/14	Veterans Day, no class
11/13/14	Global climate negotiations: a view from the South (Guest lecture)

#### **Part IV. National case studies**

11/18/14	Case Study: India, energy access, and equity
11/20/14	Case Study: Brazil and land-use change (Guest lecture: Avery Cohn)
11/25/14	Case Study: China and enforcement (Reflection 8)
11/27/14	Thanksgiving, no class
12/02/14	Case Study: European Union and EU ETS
12/04/14	Case Study: US
12/09/14	Summing up Final Paper due

## **Course Schedule and Readings**

### *Legend*

T = material posted on Trunk

BK = book

W = weblink

All of the reading assigned for this course is classified as “required” or “advanced”. Required reading must be done in advance of the class for which it is assigned. Advanced reading is not required, but it is listed for those of you with prior experience in climate change policy or for those of you who are keenly interested in a particular topic.

## **Part I: Climate Change Science, Economics, and Technology**

### *Climate Change Science*

#### **September 4**

#### *Topics*

- What is meant by climate change and what is causing climate change
- The current and anticipated impacts of climate change

#### *Required Reading*

*Note: You will not be expected to have done these readings before the first class, but you are required to read them by the end of the first week.*

- WDR 2010, “Focus A: The Science of Climate Change” (after Chapter 1). (T)
- IPCC, 2013: Summary for Policymakers. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. (T)  
[http://www.climatechange2013.org/images/report/WG1AR5\\_SPM\\_FINAL.pdf](http://www.climatechange2013.org/images/report/WG1AR5_SPM_FINAL.pdf)
- Emanuel, Kerry. “The myth of natural stability” and “Greenhouse physics” in “What we Know About Climate Change.” MIT press: Cambridge, MA. (T)
- McKibben, Bill 2006, “A New Atmosphere” in The End of Nature, Random House: New York. (T)

#### *Advanced Reading (not required)*

- InterAcademy Council, “Climate Change Assessments: Review of the Processes and Procedures of the IPCC,” 30 August 2010. (T)  
<http://reviewipcc.interacademycouncil.net/report/Climate%20Change%20Assessments.%20Review%20of%20the%20Processes%20&%20Procedures%20of%20the%20IPCC.pdf>
- The Copenhagen Diagnosis, 2009: Updating the world on the Latest Climate Science. I. Allison, N. L. Bindoff, R.A. Bindshadler, et al. The University of New South Wales Climate Change Research Centre (CCRC), Sydney, Australia. (T)

#### *Super-Advanced Reading (not required)*

- Hulme, Mike 2009. Why We Disagree About Climate Change: Understanding Controversy, Inaction, and Opportunity, Cambridge University Press.

**Key concepts and emissions scenarios**  
**September 9**

*Topics*

- Defining “dangerous anthropogenic interference”
- Emissions profiles, global scenarios under most recent IPCC AR, national scenarios, uncertainty regarding climate sensitivity, implied emission budgets

*Required Reading*

- Gallagher, K.S. 2009, “Acting in Time on Climate Change” in Gallagher, K.S. Acting in Time on Energy Policy, Brookings Institution Press: Washington, D.C: 12-38. (BK)
- Meinshausen, M., N. Meinshausen, W. Hare, S. C. B. Raper, K. Frieler, R. Knutti, D. J. Frame and M. R. Allen 2009, "Greenhouse-gas emission targets for limiting global warming to 2C." *Nature* 458 (7242): 1158-1163. (T)  
<http://www.iac.ethz.ch/people/knuttir/papers/meinshausen09nat.pdf>
- Rogelj, J., McCollum, D. L., O'Neill, B. C., and K. Riahi 2013, “2020 Emissions Levels Required to Limit Warming to below 2 C.” Vol. 3(4): 405-412. (T)
- Hansen et al. 2013, “Assessing ‘Dangerous Climate Change’: Required Reduction of Carbon Emissions to Protect Young People, Future Generations and Nature.” *PLOS ONE*, 8(12). (T)  
<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0081648>
- Ackerman, F. “Climate Economics in Four Easy Pieces.” *Development*, 51, 325–331. (T)

*Resources from lecture:*

- <http://www.mass.gov/eea/docs/eea/gwsa/ma-gwsa-5yr-progress-report-1-6-14.pdf> (p.13)
- <http://www.mass.gov/eea/air-water-climate-change/climate-change/massachusetts-global-warming-solutions-act>

*Advanced Reading*

- Hansen, J., Sato, M., Kharecha, P., Beerling, D., Berner, R., Masson-Delmotte, V., Pagani, M., Raymo, M., Royer, D. L, and J. C. Zachos 2008, “Target atmospheric CO<sub>2</sub>: Where should humanity aim?” *Open Atmos. Sci. J.*, Vol. 2: 217-231. (T) <http://arxiv.org/abs/0804.1126>
- Rahmstorf S. 2000. "The Thermohaline Ocean Circulation: A System With Dangerous Thresholds" *Climatic Change* 46: 247-256 (update to Broecker, see below).
- Broecker WS. 1997. “Thermohaline Circulation, the Achilles Heel of Our Climate System: Will Man-Made CO<sub>2</sub> Upset the Current Balance?” *Science* 278: 1582-1588.
- GEA. 2012. Energy Pathways for Sustainable Development, Chapter 17 of the Global Energy Assessment, Cambridge University Press (available for download at: [http://www.iiasa.ac.at/web/home/research/Flagship-Projects/Global-Energy-Assessment/Chapters\\_Home.en.html](http://www.iiasa.ac.at/web/home/research/Flagship-Projects/Global-Energy-Assessment/Chapters_Home.en.html))
- Van Vuuren, D. P., Edmonds, J., Kainuma, M., Riahi, K., Thomson, A., Hibbard, K., Hurtt, G. C., Kram, T., Krey, V., Lamarque, J.-F., Masui, T., Meinhausen, M., Nakicenovic, N., Smith, S. J., and S. K. Rose, 2011 “The Representative Concentration Pathways: An Overview.” *Climatic Change* 109: 5-31.

**Bridging science, economics and policy**

**September 11**

Reflection 1 due

### *Topics*

- Uncertainty and risk
- Defining “precautionary principle”
- Cost-benefit analyses
- Discounting
- Externalities and the social cost of carbon
- Persistent debates (discount rates, price elasticity, optimism about technological improvements, price vs. quantity instruments, policy “silver bullets”)

### *Required Reading*

- Giles, Jim 2002, “Scientific uncertainty: When doubt is a sure thing,” *Nature* 418, 476-478 (T)
- Stern, Nicholas 2006, “Executive Summary (Long) of the Stern Review on the Economics of Climate Change” report to the Prime Minister and the Chancellor of the Exchequer on the Economics of Climate Change (T) [www.hm-treasury.gov.uk/sternreview\\_index.htm](http://www.hm-treasury.gov.uk/sternreview_index.htm)
- Arrow, Kenneth 2007, “Global Climate Change: A Challenge to Policy,” *Economists Voice*, Berkeley Electronic Press, June. (T)
- Greenstone, Michael and Adam Looney 2013, “Paying too much for energy? The true costs of our energy choices,” *Daedalus*, Vol. 141, No. 2, pp. 10-30.
- Russo, Gene, “Pipeline emissions up to four times worse than predicted,” *Nature News*, 10 August 2014, [http://www.nature.com/news/pipeline-emissions-up-to-four-times-worse-than-predicted-1.15692?WT.ec\\_id=NEWS](http://www.nature.com/news/pipeline-emissions-up-to-four-times-worse-than-predicted-1.15692?WT.ec_id=NEWS)

### *Advanced Reading:*

- Manney et al. 2011. “Unprecedented Arctic Ozone Loss in 2011” *Nature* 478: 469- 477 (a cautionary tale about unexpected consequences).
- Kriegler, Elmar, Hall, Jim, Held, Hermann, Dawson, Richard, and Hans Joachim Schellnhuber, “Imprecise probability assessment of tipping points in the climate system,” *Proceedings of the National Academy of Sciences*, Vol. 106 (13): 5041-45. (T)

### *Important Commentaries on the Stern Report*

- Nordhaus, William D 2006, “The “Stern Review” on the Economics of Climate Change” National Bureau of Economic Research, Inc, NBER Working Papers: 12741, 2006 (T) [www.nber.org/ezp-prod1.hul.harvard.edu/papers/w12741.pdf](http://www.nber.org/ezp-prod1.hul.harvard.edu/papers/w12741.pdf)
- Dasgupta, Partha 2007, “Commentary: The Stern Review’s Economics of Climate Change,” *National Institute Economic Review*,” No. 199, January. (T) <http://ner.sagepub.com/cgi/reprint/199/1/4.pdf>

## ***Clean energy technologies and their costs***

**September 16**

### *Topics:*

- Pros and cons of energy technologies for mitigation
- Brief overview of how these technologies work
- Relative costs as of 2013

### *Required Reading:*

- Grubler et al. 2012, “Energy Primer” in *Global Energy Assessment*, Cambridge University Press (available for download at: [http://www.iiasa.ac.at/web/home/research/Flagship-Projects/Global-Energy-Assessment/Chapters\\_Home.en.html](http://www.iiasa.ac.at/web/home/research/Flagship-Projects/Global-Energy-Assessment/Chapters_Home.en.html)).

- Gallagher, K.S. 2014, “Competing Against Incumbents,” Chapter 6 in *The Globalization of Clean Energy Technologies: Lessons from China*, The MIT Press: Cambridge, MA. (BK)

*Advanced Reading*

- GEA. 2012. Chapters 11-15 of the [Global Energy Assessment](http://www.iiasa.ac.at/web/home/research/Flagship-Projects/Global-Energy-Assessment/Chapters_Home.en.html), Cambridge University Press (available for download at: [http://www.iiasa.ac.at/web/home/research/Flagship-Projects/Global-Energy-Assessment/Chapters\\_Home.en.html](http://www.iiasa.ac.at/web/home/research/Flagship-Projects/Global-Energy-Assessment/Chapters_Home.en.html))
  - Chapter 11: Renewable Energy
  - Chapter 12: Fossil Energy
  - Chapter 13: Carbon Capture and Storage
  - Chapter 14: Nuclear Energy
  - Chapter 15: Energy Supply Systems

***Mitigation Technology: The Stabilization Wedges Game***

**September 18**

Reflection 2 due

*Topics*

- Synthesize understanding of science and economics in team-discussion game.

*Required Reading (you must have read these articles in advance for the game to work)*

- Pacala, S. and R. Socolow, “Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies,” *Science*, 305(5686): 968 – 972. (T)
- Socolow, R. 2011, “Wedges Reaffirmed” *Bulletin of Atomic Scientists*, <http://www.thebulletin.org/wedges-reaffirmed>.

***Climate Summit 2014***

**September 23**

*Topics:*

- Climate Summit 2014

*Required Reading:*

- Gillis, J. “U.N. Draft Report Lists Unchecked Emissions’ Risks”, New York Times, <http://nyti.ms/1tA1uQL> (W)
- "Media Advisory: UN Secretary-General’s Climate Summit to highlight bold new approaches and actions on climate change." (page 1-2) (T)
- "Climate Summit 2014: Action areas." <http://www.un.org/climatechange/summit/action-areas/> (W)

***Adaptation***

**September 25**

Problem Set 1 due

*Topics:*

- Key climate impacts, and key terminology (adaptive capacity, resilience, vulnerability, hazards)
- Ways that adaptation and mitigation differ from a policy perspective
- Financing: how is financing different for adaptation and mitigation? What are potential sources of funding, funding mechanisms?
- Equity issues in adaptation and implications for policy and negotiations

- Options that are beneficial from both an adaptation and mitigation perspective

#### *Required Reading*

- IPCC, 2014: Summary for policymakers. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1-32. (T)
- Susanne C. Moser and Maxwell T. Boykoff. 2013. "Climate Change and Adaptation Success: The Scope of the Challenge" in *Successful Adaptation to Climate Change*, Moser and Boykoff (eds) Routledge: Oxon and New York, pages 1-34. (T)
- Khan, M. and J.T. Roberts. 2013. "Adaptation and International Climate Policy" Wiley Interdisciplinary Reviews: Climate Change, Vol. 4, Issue 3, pp. 171-189. (T)

#### *Advanced Reading:*

- Challinor, A. Wheeler, T., Garforth, C., Craufurd, P. and A. Kassam 2007, "Assessing the vulnerability of food crop systems in Africa to climate change," *Climatic Change*, Vol. 83, No. 3: 381-399. (T)

## **PART II: Climate Change Politics and Policy Options**

### *Policy instruments – 3 classes*

**September 30, October, 7, 9**

Reflection 4 and Problem Set 2 due on Oct. 7

#### *Topics:*

- Goals, targets, and criteria
- Typology of policy approaches
- Advantages and disadvantages to economy-wide vs. sectoral approaches
- Market-based instruments
- Regulatory options
- Sectoral approaches

#### *Required Reading for September 30*

- Weisbach, David: "Instrument choice is instrument design" in Metcalf, Gilbert (ed) *U.S. Energy Tax Policy*, Cambridge University Press 2011, pp. 113-167. (T) •
- Revkin, Andrew C "Accounting for the Expanding Carbon Shadow From Coal-Burning Plants" *New York Times* (Opinion Pages), August 28, 2014.  
<http://dotearth.blogs.nytimes.com/2014/08/28/accounting-for-the-expanding-carbon-shadow-from-coal-burning-plants> (W)

#### *Advanced Reading for September 30*

- Davis, Steven J and Robert H Socolow 2014, "Commitment accounting of CO2 emissions." *Environmental Research Letters*, 9, 9pp.

#### *Required Reading for October 7*

- Watkiss, Paul and Christopher Hope 2011, "Using the social cost of carbon in regulatory deliberations." *WIREs Climate Change*, 2: 886–901. (T)



- “Cutting emissions pays for itself, research shows.” Phys.org, August 24, 2014. <http://phys.org/news/2014-08-emissions.html> (W)
- Koonin, Steven E. “Climate Science Is Not Settled.” Wall Street Journal, September 19, 2014. <http://online.wsj.com/articles/climate-science-is-not-settled-1411143565> (W)
- EPA 111D documentation (TBD)

#### Required Reading for October 9

- Parson, Edward A. and Eric L. Kravitz 2013, “Market Instruments for the Sustainability Transition,” *Annual Review of Environment and Resources*, Volume 38, pages: 4.1-4.26. (T)
- Nordhaus, William D. 2007, “To Tax or Not to Tax: Alternative Approaches to Slowing Global Warming,” *Review of Environmental Economics and Policy*, Winter: 26-44. (T)
- Metcalf, Gilbert and David Weisbach 2009, “The Design of a Carbon Tax,” *33 Harv. Envtl. L. Rev.* 499. (T)
- Stavins, Robert N. 2007, “A U.S. Cap-and-Trade System to Address Global Climate Change,” The Hamilton Project Discussion Paper 2007-13, Brookings Institution, Washington, DC: October. (T)  
[www.brookings.edu/~media/Files/rc/papers/2007/10climate\\_stavins/10\\_climate\\_stavins.pdf](http://www.brookings.edu/~media/Files/rc/papers/2007/10climate_stavins/10_climate_stavins.pdf)

#### *Sectoral Policy Readings (optional, but strongly encouraged for October 7)*

- Schmidt, Jake, Helme, Ned, Lee, Jin and Mark Houdashelt 2008, “Sector-based approach to the post-2012 climate change policy architecture,” *Climate Policy* Vol. 8: 494–515 (T)
- Meckling, Jonas O. and Gu Yoon Chung 2009, “Sectoral Approaches for a Post-2012 Climate Regime: A Taxonomy” *Climate Policy*, volume 9, issue 6: 652-668. (T)
- Al-Juaied, Mohammed and Adam Whitmore 2009, “The Real Costs of Carbon Capture”, BCSIA Discussion Paper, Harvard Kennedy School: Cambridge, MA. (T) (skim over the model in the middle – the point is to understand the costs of CCS and how they compare to other technology options)
- Morrow, W. Ross, Gallagher, K.S., Collantes, Gustavo, and Henry Lee 2010, “Analysis of Policies to Reduce Oil Consumption and Greenhouse-Gas Emissions from the U.S. Transportation Sector,” *Energy Policy*, Volume 38, Issue 3, March: 1305-1320 (T) (skim over the description of the NEMS model and focus on the results, and why transportation might need targeted policies)
- Wold, Chris, Hunter, David, and Melissa Powers 2009, “Land Use and Forestry” (Chapter 7) in *Climate Change and the Law*, Lexis Nexis: Newark and San Francisco, pages 271-300. (BK)

#### ***Role of media and public perceptions of climate change***

##### **October 2**

Reflection 3 due

Guest Lecture

#### *Topics*

- Polling over time
- Presentation of the “debate”
- Reductionism

#### *Required Reading*

- Ansolabehere, Stephen and David Konisky 2012, “The American Public Energy Choice,” *Daedalus*, Vol. 141, No. 2, pg. 61-71. (T)
- Brechin, Steven R. and Medani Bhandari 2011, “Perceptions of Climate Change Worldwide,” *Wiley Interdisciplinary Reviews: Climate Change*, Volume 2, Issue 6, 871-885. (T)

- Ansolabehere, Stephen and David Konisky 2014, “Energy: What Americans really want,” Boston Globe, September 14. (L)

#### *Advanced Reading*

- Center for Research on Environmental Decisions 2009, “The Psychology of Climate Change Communication: A Guide for Scientists, Journalists, Educators, Political Aides, and the Interested Public,” Columbia University, New York (available for download at: <http://www.cred.columbia.edu/guide/>). (T)

#### ***Policy instruments for global climate policy***

**October 14**

Reflection 5 due

#### *Required Reading*

- Metcalf, Gilbert E. and David Weisbach 2010, "Linking Policies When Tastes Differ: Global Climate Policy in a Heterogeneous World." Discussion Paper 2010-38, Harvard Project on International Climate Agreements, Belfer Center for Science and International Affairs, Harvard Kennedy School (T).
- Keohane, Robert O. and David G. Victor 2010, “The Regime Complex for Climate Change,” APSA 2010 Working Paper [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1643813##](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1643813##) (July 2010 version). (T).
- Romani, M. and N. Stern 2013, “Sources of Finance for Climate Action: Principles and Options for Implementation Mechanisms in This Decade” in *International Climate Finance* edited by Erik Haites. Routledge: Oxon. (T)

#### ***Policies for technological innovation***

**October 16**

Reflection 6 due

#### *Required Readings:*

- Jenkins, J. and Mansur. S. 2011. “Bridging The Clean Energy Valleys of Death: Helping American Entrepreneurs Meet the Nation’s Energy Innovation Imperative.” Breakthrough Institute. (T)
- Pernick, R., Wilder, C., Belcher, J. 2014. “Clean Energy Trends 2014.” CleanEdge. (T)
- CleanEdge, 2014. “2014 US Clean Tech Leadership Index.” (T)
- Pfund, N. and Healey, B. 2011. “What Would Jefferson Do? The Historical Role of Federal Subsidies.” DBL Investors. (T)

#### *Advanced Readings:*

- Trembath, A., Jenkins, J., Nordhaus, T. and Shellenberger, M. 2012. “Where the Shale Gas Revolution Came From: Government’s Role in the Development of Hydraulic Fracturing in Shale. Breakthrough Institute.” (T)
- Jenkins, J., Muro, M., Nordhaus, T., Shellenberger, M., Tawney, L. and Trembath, A. 2012. “Beyond Boom & Bust: Putting Clean Tech on a Path to Subsidy Independence.” (T)

#### ***Policies for “Technology Transfer”***

**October 21**

#### *Topics*

- Technological capabilities, how they differ internationally, and how they can be improved
- Catching up

- Leapfrogging
- Market formation
- Globalization of the clean energy technologies
- Intellectual property issues

*Required Reading*

- Gallagher, K.S. 2014, “Introduction” (Chapter 1) and “The Global Diffusion of Clean Energy Technologies (Chapter 7) in The Globalization of Clean Energy Technologies: Lessons from China, The MIT Press: Cambridge, MA. (BK)

*Advanced Reading:*

- Goldemberg, Jose 1998, “Leapfrog Energy Technologies,” *Energy Policy* 26(10): 729-741 (T)
- Gallagher, K.S. 2006, “Limits to Leapfrogging in Energy Technologies? Evidence from the Chinese automobile industry” *Energy Policy* 34: 383-394 (T)
- UNEP, EPO, and UCTSD 2010, “Patents and clean energy: bridging the gap between evidence and policy,” Summary of the Report, available at: <http://www.epo.org/news-issues/issues/clean-energy.html> (W)
- Grubler A. 2010. “The Costs of the French Nuclear Scale-Up: A Case of Negative Learning by Doing.” *Energy Policy* 38: 5174-5188.

*Politics of climate change*

**October 23**

Policy Analysis due

*Topics:*

- How politics affects domestic policy
- How politics differ among countries, and why
- How domestic politics affects foreign policy and international negotiations

*Required Reading*

- Harrison, Kathryn and Lisa McIntosh Sundstrom 2007, “The Comparative Politics of Climate Change,” *Global Environmental Politics*, 2007, Vol. 7, No. 4: 1-18 (T).
- Grundig, Frank 2009. “Political Strategy and Climate Policy: A Rational Choice Perspective,” *Environmental Politics*, 2009, Vol. 18, No. 5:747-764. (T)

*Choose at least one article from the following series:*

- Navroz K. Dubash 2013, “The politics of climate change in **India**: narratives of equity and cobenefits,” Volume 4, Issue 3, May/June 2013, Pages: 191–201. (T)
- Kate Crowley 2013, “Pricing carbon: the politics of climate policy in **Australia**” *Wiley Interdisciplinary Reviews Climate Change*, online 21 JUN, DOI: 10.1002/wcc.239 (T)
- Ye Qi and Tong Wu 2013, “The politics of climate change in **China**” *Wiley Interdisciplinary Reviews Climate Change*, Vol. 4, Issue 4, pages 301-313. (T)
- Henrik Selin and Stacy D. VanDeveer 2011, “**US** climate change politics and policymaking,” *Wiley Interdisciplinary Reviews Climate Change*, Vol. 2, Issue 1, pages: 121–127. (T)
- Schreurs Miranda A. and Yves Tiberghien 2007, “Multi-Level Reinforcement: Explaining **European Union** Leadership in Climate Change Mitigation.,” *Global Environmental Politics*, Vol. 7, Issue 4, pages 19-46. (T)

*Advanced Reading*

- Newell, Peter 2008, “Civil Society, Corporate Accountability and the Politics of Climate Change,” *Global Environmental Politics*, Vol. 8, No. 3: 122-153. (T)
- Dolšak, Nives. "Climate Change Policy Implementation: A Cross-Sectional Analysis." *Review of Policy Research* 26, no. 5 (2009): 551-570. (T).
- Harrison, K. and L. M. Sundstrom 2010 *Global Commons, Domestic Decisions: The Comparative Politics of Climate Change* The MIT Press. (BK)

### **PART III: Global Climate Negotiations**

#### *Topics*

- UNFCCC and Kyoto Protocol
- Bali Action Plan
- Copenhagen (COP15)
- Road to Durbin
- Major issues (e.g. targets, timetables, equity (Sivan Kartha), principles, tech transfer, financing)
- Negotiating blocs and their fragmentation (e.g. AOSIS, G-77 and China, major economies)
- Institutions (UN vs. non-UN forums)
- SBSTAs and Role of IPCC
- Bilateral initiatives
- Coping with complexity in issues and actors
- The role of NGOs in the negotiation process
- Discussion of current negotiation positions of major emitters.

#### **Global climate change negotiation history**

##### **October 28**

#### *Required Reading*

- Wold, Chris, Hunter, David, and Melissa Powers 2009, “The UN Framework Convention on Climate Change” (Chapter 4); “Introduction to the Kyoto Protocol” (Chapter 5); and “Implementing the Kyoto Protocol,” (Chapter 6) in *Climate Change and the Law*, Lexis Nexis: Newark and San Francisco, pages 127-269. (BK) (A basic introduction to the history – skip if you are already familiar)
- Dimitrov, Radoslav S. 2010, “Inside Copenhagen: The State of Climate Governance,” *Global Environmental Politics*, Vol. 10, No. 2: 18-24. (T)
- Prins, G. et al 2010, “The Hartwell Paper: A New Direction for Climate Policy after the Crash of 2009.” (T)
- Actual Text of International Agreements:
  - UN Framework Convention on Climate Change, 1992 (T)
  - Kyoto Protocol to the UNFCCC, 1997 (T)
  - Bali Road Map, 2007 (T)
  - Copenhagen Accord, 2009 (T)
  - Durban Platform, 2011 (T)

#### *International negotiation simulation*

##### **October 30 and November 4**

##### **Reflection on November 6**

Negotiation Simulation Reflection Due on Nov. 6

#### *Topics*

- Conduct simulated negotiations in teams. Instructions will be handed out before the simulation.

### Homework

- There is not any additional assigned reading for the simulation, but you are expected to be well-versed and intimately familiar with your negotiating position and the negotiating positions of other parties.
- You must prepare IN ADVANCE for this simulation. You will receive your team assignments and instructions on November 2.

### Global climate negotiations: a view from the South (Guest Lecture) November 13

#### Required reading:

- Sanwal, Mukul, “Reflection on the climate negotiations: a Southern perspective,” *Climate Policy*, Vol. 9, No. 3: 330-333. (T)

### PART IV: Case Studies in Climate Change Policy *Case studies of domestic climate change policies (5 classes)* *Remainder of semester, 1 class per case study*

- **India and Equity** (November 18)
  - Government of India 2009, “The Road to Copenhagen: India’s Position on Climate Change Issues,” (T)
  - Chikkatur, A. Ambuj Sagar 2009, "Positioning the Indian Coal-Power Sector for Carbon Mitigation: Key Policy Options." White Paper, Pew Center on Global Climate Change, January. (T)
  - Byravan, Sujatha and Rajan, Sudhir Chella. 2012. An Evaluation of India’s National Action Plan on Climate Change, Centre for Development Finance (CDF), IFMR and Humanities and Social Sciences, IIT Madras, Available at: [www.indiaclimatemissions.org](http://www.indiaclimatemissions.org) (T)
- **Brazil and Land-use Change** (November 20)
  - Government of Brazil 2004, “Executive Summary of Brazil’s Initial National Communication to the UNFCCC,” <http://unfccc.int/resource/docs/natc/brazilnc1e.pdf> (T)
  - Nepstad, D., Stickler, C., Soares-Filho, C., and F. Merry 2008, “Interactions among Amazon land use, forests and climate: prospects for a near-term forest tipping point,” *Philosophical Transactions of the Royal Society*, Vol. 363, No. 1498: 1737-1746. (T)
  - Fargione, J., Hill, J., Tilman, D., Polasky, S., and P. Hawthorne 2008, “Land Clearing and the Biofuel Carbon Debt,” *Science*, February: 1235-1238 (T)
  - De La Torre, Augusto, Fajnzylber, Pablo, and John Nash 2009, “Low-Carbon: High Growth: Latin American Responses to Climate Change,” World Bank Latin American and Caribbean Studies Program: Washington, DC (T)
- **China and Enforcement** (November 25)  
Reflection 8 due
  - Seligsohn, Deborah, “China Moving Forward on 12th Five Year Plan Climate and Energy Implementation,” Blog Post on China FAQs, World Resources Institute: <http://www.chinafaqs.org/blog-posts/china-moving-forward-12th-five-year-plan-climate-and-energy-implementation-targets-taxes-> (W)
  - State Council of the People’s Republic of China 2008, “White paper: China's policies and actions on climate change,” October. [http://www.english.gov.cn/2008-10/29/content\\_1134544.htm](http://www.english.gov.cn/2008-10/29/content_1134544.htm). (T)

- Xiaowei, Xuan and Kelly Sims Gallagher, 2013, “China’s Domestic Policy Options for Reducing Carbon Intensity,” CIERP Discussion Paper, The Fletcher School (T).
- Marland, Gregg 2012, “Emissions Accounting: China’s Uncertain CO2 Emissions,” *Nature Climate Change*, Vol. 2(9): 645-646. (T)
- Bradsher, Keith, “Natural Gas Production Falls Short in China,” *New York Times*, August 21, 2014. [http://www.nytimes.com/2014/08/22/business/energy-environment/chinas-effort-to-produce-natural-gas-falls-far-short.html?\\_r=0](http://www.nytimes.com/2014/08/22/business/energy-environment/chinas-effort-to-produce-natural-gas-falls-far-short.html?_r=0)
- "China Confronts Its Coal Problem", *New York Times*, August 16, 2014. <http://nyti.ms/VtH4va>
- **European Union and the EU Emissions Trading Scheme** (December 2)
  - Commission of the European Communities 2011, “Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions: A Roadmap for moving to a competitive low carbon economy in 2050,” COM(2011) 16. (T)
  - Skjærseth, Jon Birger and Jørgen Wettestad 2009, “The Origin, Evolution and Consequences of the EU Emissions Trading System,” *Global Environmental Politics*, Vol. 9, No. 2: 101-122. (T)
  - Ellerman, Denny 2008, “The EU’s Emissions Trading Scheme: A Proto-type Global System?” MIT Center for Energy and Environmental Policy Research, Discussion Paper WP-2008-013, Cambridge, MA (T): <http://web.mit.edu/ceepr/www/publications/workingpapers/2008-013.pdf> (T)
- **US** (December 4)
  - Readings TBD

**Summing up**  
**December 9**  
 Final Paper due

## **Web Resources**

*\*Please note I do not necessarily endorse any of the material on these websites\**

### **Technical and Scientific Resources**

**Carbon Dioxide Information Analysis Center (CDIAC)** - <http://cdiac.ornl.gov/trends/trends.htm>

**EU Greenhouse Gas Viewer** - <http://dataservice.eea.europa.eu/PivotApp/pivot.aspx?pivotid=475>

**Climate Analysis Indicator Tool** - <http://cait.wri.org/>

**EPA Climate Change** – <http://www.epa.gov/climatechange/>

**National Snow and Ice Data Center** - <http://nsidc.org/arcticseaicenews/>

**World Bank Indicators** - <http://data.worldbank.org/topic/climate-change>

**U.S. Energy Information Administration** - <http://www.eia.gov/environment/>

### **Negotiation and Policy Resources**

**UN Framework Convention on Climate Change (UNFCCC)** - <http://www.unfccc.int>

**COP16 Website** – <http://www.cc2010.mx/en/>

**Earth Negotiations Bulletin / International Institute for Sustainable Development** – See links:

<http://www.iisd.ca>

**Harvard Project on International Climate Agreements** -

[http://belfercenter.ksg.harvard.edu/project/56/harvard\\_project\\_on\\_international\\_climate\\_agreements.html](http://belfercenter.ksg.harvard.edu/project/56/harvard_project_on_international_climate_agreements.html)

**Climate Action Tracker** – <http://www.climateactiontracker.org/>

### **Financing, Adaptation, and Development Resources**

**Climate Funds** - <http://www.climatefundsupdate.org/>

**Global Adaptation Atlas** - <http://www.adaptationatlas.org/>

### **News and Information Resources**

**Dot.earth blog** - <http://dotearth.blogs.nytimes.com/>

**Climate Wire** - <http://www.eenews.net.ezproxy.library.tufts.edu/cw> (available through Ginn E-resources)

**ClimateProgress blog** - <http://climateprogress.org/>

**Climate Feedback blog** - <http://blogs.nature.com/climatefeedback/>

**Nature Reports Climate Change** - <http://www.nature.com/climate/index.html>

**NOAA Climate Watch** - <http://www.climatewatch.noaa.gov/>

### **Journals (all available through E-Journals @Tufts)**

**WIRES: Climate Change**

**Nature: Climate Change**

**Climate Policy**

**Energy Policy**

**Annual Review of Environment and Resources**

Updated 8/2013