PA 777
The Economics of Environmental Policy
Spring 2009

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Office Hours:
Monday 10:00-11:30
Tuesday 10:00-noon
or by appointment

Course Description: This course provides an introduction into the principles of environmental economics, with a focus on policy applications. The principal problem in any economics course is how to best allocate scarce resources. This holds true for environmental economics as well. However, environmental resources differ from other goods that economists study in that there is usually no market for them. Thus, government policies are needed to maintain and improve environmental quality.

The course begins by examining how economic incentives lead to environmental problems, and discussing various options for dealing with these problems. Because economic analysis requires information on both costs and benefits, we next discuss methods for valuing the benefits of environmental amenities. The course continues with applications to various policy issues, including the environment in developing countries, international issues, and energy. We conclude with a discussion of the political economy of environmental issues.

Goals of the course: The main objective of this course is for you to learn how to think critically about issues relating to environmental economics. Upon completion of this course, you should be able to explain the economic rationale for government involvement in environmental issues, and be able to discuss what the impact of such involvement will be. In particular, it is hoped that the class will provide you with a better understanding of current issues relating to the environment.

Accomplishing these goals requires not only a mastery of the theory of environmental economics, but also an ability to apply these theories to real world issues. As such, much of the content of the course will apply the basic tools of environmental economics to current event issues.

Learning to apply economics to the real world takes practice. The assignments for this class are designed to get you thinking and writing using economic analysis. In addition, classroom discussion plays an important role in developing the skills to apply economic theory to the real world. Active participation in discussions, both in class and via e-mail (discussed below) is vital to success in this course. For this reason, class participation will count towards ten percent of your course grade. Don't be afraid to participate because you feel what you have to say isn't important or may not be correct. Many of the things we will discuss in this class have no right answers. Your opinions matter! The class participation grade will consist of two components: participation in general class discussions and participation in discussions on the class e-mail discussion list. I will occasionally use the list to post follow-up questions to topics discussed in class.

Prerequisites: The prerequisite for this course is PPA 723, Managerial Economics for Public Administrators, or an equivalent course in microeconomics. If you have any questions about whether or not you have taken an appropriate course, please see me as soon as possible.

Class Home Page: The home page for this class is:

http:// classes.maxwell.syr.edu/ppa777

You can also connect to the home page through my personal home page, which can be found at:

http://faculty.maxwell.syr.edu/dcpopp/index.html

The web site includes information about assignments and links to other useful economic sites. These links may be particularly useful as you work on your research paper.

E-mail: All students in the class are required to have an e-mail account and to check e-mail regularly. An e-mail discussion list will be set up for the class, to which you should subscribe. Information on how to subscribe is included below. Participation in a class e-mail discussion list makes up part of your class participation grade. In addition, I will occasionally make announcements about assignments and class material via the discussion list. Not subscribing is not an appropriate excuse for missing these announcements.

E-mail discussion group: I have set up an e-mail discussion group for the class. All students are expected to subscribe to the mailing list. You may use this list for any class related activities, such as asking questions, continuing discussions from class, and instigating new discussions. I will use the list to keep you informed about assignments, answer questions, and instigate discussion. When messages are sent to the list, all students subscribed to the list will get the message.

To subscribe to the list, send an e-mail to listserv@listserv.syr.edu with the following message:

SUB EnviEcon Jan Smith

Note that this is all that need be in the body of the message, and that it must be typed in exactly as written, except, of course, that you should replace your name for Jan Smith. When you sign up, you will receive a message with detailed instructions for participating in the mailing list. ***This message will ask that you reply, so as to confirm that you intended to join the list. It is important that you remember to reply, or else you will not be added to the list!***

A couple of technical notes: E-mails sent to the list are sent to EVERYONE who subscribes to the list. If you want to send a personal e-mail to a specific class member (or to me), use their e-mail address, not the list's address. The list is a good place to ask questions about class materials, because everyone can see the answer. It is not the way to let me know that you are going to miss class on Monday. For that you should send an e-mail to me personally. Also, I am considered the owner of this list. If you experience any problems, please e-mail me directly. My e-mail address is dcpopp@maxwell.syr.edu.

Reading: Two books are required for this class. They are:

1) *Environmental Economics: An Introduction*, 5th edition, by Barry C. Field & Martha K. Field
2) *Economics of the Environment: Selected Readings*, fifth edition, edited by Robert N. Stavins.

Both texts are available at the Orange Bookstore. Older editions of either text are fine. The Stavins book is a compilation of readings from various sources. Thus, older editions may not have all of the articles that the new edition includes. However, if you choose to buy a used older edition, you should be able to find these articles elsewhere. In addition to these readings, there are several additional articles intended to supplement the text. The class web site includes links to these articles. When possible, direct links to the articles are provided. The remainder are available through the course reserve system at the Syracuse University library – a link to Blackboard, where these items can be found, is included for these articles.

The readings in Stavins and the supplemental readings have two purposes: to expose you to influential work in environmental economics and to highlight the relevance of environmental economics to current events. The first goal is accomplished through journal articles written by professional economists. Many of these are contained in Stavins. At times, these articles may get quite technical. When that occurs, you are encouraged to focus on the main arguments and conclusions of the paper, and to simply browse through the technical parts. The second goal is met be several shorter articles taken from current events publications. Articles in the *Journal of Economic Perspectives* are particularly useful, as they fall under both categories. These articles usually provide summaries of work done by professional economists on current events issues. You may also find it helpful to consult other articles in this journal for paper ideas. In addition, students interested in additional reading on any topic are encouraged to check the bibliography "Readings in the Field of Natural Resource & Environmental Economics" by Alexander Pfaff and Robert Stavins. This bibliography is available on-line at: http://ksghome.harvard.edu/~rstavins/Papers/Readings_in_the_field_of.pdf. In addition, I would be happy to help any student find the appropriate readings to fit their interests.

Grading: *Masters' Students*: Your grade in this course will be based on participation in class and e-mail discussions (10%), two take home quizzes (15% each), participation in the Climate Policy Simulation (10%), a take home final exam (20%), and a research paper (30%). The take home quizzes will be handed out in class, and due the following class meeting. They will focus on applications of the material discussed in class, and will be in the form of short problem or essay questions. The take home final will be given during the final exam period.

Ph.D. Students: Ph.D. students may choose to complete the assignments for masters' students listed above, or to instead complete the following assignments designed to get you thinking about the research process. Ph.D. students should come talk to me as soon as possible to discuss which option is appropriate for them. All Ph.D. students will participate in the policy simulation, and will do a research paper. However, rather than take the exams, Ph.D. students may elect to do a referee report of a working paper in the field. In addition, the requirement for the research paper will be different. Ph.D. students should consider the paper to be a research proposal. That is, in addition to identifying an interesting question, you should think about *how* you would go about answering the question. Note that, given the time constraints of a one-semester course, it is not necessary that you carry out the research. The grading for Ph.D. students choosing this option will be: participation in class and e-mail discussions (10%), participation in the Climate Policy Simulation (10%), the referee report (30%), and a research paper (50%).

Finally, note that if you miss a class, it is your responsibility to find out if you missed any assignments or handouts. Not being present when an assignment was given out is **not** an acceptable excuse for missed or late work!

Research Paper: The major assignment for this class is a semester-long research paper on a topic of your choosing. The research paper will be due on the last day of class. It should be between 10 and 15 pages, double-spaced. I will hand out more details on the paper, including suggestions for topics, further into the course. The paper should apply the materials of the course to a public policy question. It should include a summary of the relevant theory that applies to your topic, and apply the theory to the problem to reach a conclusion. To make sure that you are on the right track, a one-page statement of your proposed research topic is due ***Monday, March 2*** In it, you should state the question that you wish to address, briefly describe why it is important, and propose the means by which you will analyze your proposed topic. The final paper will be due at the beginning of our last class meeting on ***Monday, April 27.***

Policy Simulation: The Climate Policy Simulation, held on ***April 13*** will give you a chance to make use of many of the things we have discussed in class in an actual policy setting. Students will be assigned to groups representing various players in the climate change debate – such as the US, Europe, and various developing countries. Each group will be responsible for preparing a 2-3 page policy brief that outlines your goals. The simulation will begin with a five-minute presentation from each group outlining these goals. The remainder of the class will be left for negotiations among the groups. Attendance at the simulation is important, and makes up 10% of your grade for the course. If you will be unable to attend, please let me know in advance. Unexcused absences will receive a zero for that portion of your grade.

Academic Honesty: Students are expected to abide by the academic rules and regulations established by Syracuse University. These require students to "exhibit honesty in all academic endeavors. Cheating in any form is not tolerated, nor is assisting another person to cheat. The submission of any work by a student is taken as a guarantee that the thoughts and expressions in it are the student's own except when properly credited to another. Violations of this principle include giving or receiving aid in an exam or where otherwise prohibited, fraud, plagiarism, or any other deceptive act in connection with academic work. Plagiarism is the representation of another's words, ideas, programs, formulae, opinions, or other products of work as one's own, either overtly or by failing to attribute them to their true source" (*Syracuse University Bulletin* 2003-2004: p. 2). Of particular importance, while you are free to cite the views of others in your work, the final product must be *in your own words*, and any references to the works of others, whether directly quoted or merely paraphrased, must be cited. A good reference on the proper attribution of sources can be found at http://www.dartmouth.edu/~sources/. For more information on Syracuse University's academic integrity policies, see http://academicintegrity.syr.edu.

In compliance with section 504 and the Americans with Disabilities Act (ADA), Syracuse University is committed to ensure that "no otherwise qualified individual with a disability…shall, solely by reason of disability, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity…" If you feel that you are a student who may need academic accommodations due to a disability, then you should immediately register with the Office of Disability Services (ODS) at 804 University Ave., Room 309 3rd Floor, 315-443-4498 or 315-443-1371 (TDD only). ODS is the Syracuse University office that authorizes special accommodations for students with disabilities.

Course Outline

I. Introduction

January 12 – What is Environmental Economics?

Reading: Field, Chapter 1
"The ethics gap," *The Economist*, December 2, 2000, p. 78.
Fullerton, Don and Robert N. Stavins, "How Economists See the Environment," *Nature*, vol. 395, 1998, reprinted in *Readings*.
Vascellaro, Jessica E., "Green Groups See Potent Tool in Economics," *The Wall Street Journal*, August 23, 2005.

January 14 – Scarcity: The Key Problem in Economics

Reading: Field, Chapter 2
Lomborg, Bjorn, "The truth about the environment," *The Economist*, August 4, 2001, pp. 63-65.

II. Tools of Economic Analysis

January 21 – Market Failures

Reading: Field, Chapter 3 (review: optional)
Field, Chapter 4
Hardin, Garrett, "The Tragedy of The Commons," *Science*, vol. 162, 1968, pp. 1243-1248, reprinted in *Readings*.
"A rising tide," *The Economist*, September 20, 2008, pp. 97-98.
"Commons sense," *The Economist*, August 2, 2008, p. 76.

January 26 – Modeling Pollution

Reading: Field, Chapter 5

III. Government Intervention in Environmental Policy

January 28 – Should the Government Intervene?

Reading: Field, Chapters 9 & 10
Coase, Ronald, "The Problem of Social Cost," *The Journal of Law and Economics*, vol. 3., October 1960, pp. 1-44, reprinted in *Readings*.
Broder, John M., "Los Angeles Groups Agree to Airport Growth, for a Price," *The New York Times*, December 17, 2004, A22.
Egan, Timothy, "Oregon's Property Rights Law Kicks In, Easing Rigid Rules," *The New York Times*, July 25, 2006, p. A14.

February 2 – Command and Control Policies for the Environment: The Case of Water

Reading: Field, Chapters 11 &14
Stavins, Robert N. (2006), "Vintage-Differentiated Environmental Regulation," *Stanford Environmental Law Journal*, 25(1), 29-63.

February 4 & 9 – Emissions Fees and Subsidies

Reading: Field, Chapter 12

Fullerton, Don, Andrew Leicester, and Stephen Smith (2008), "Environmental Taxes," *NBER Working Paper #14197* (sec. 1-4 required, 5-8 optional).

Millock, Katrin and Thomas Sterner (2004), "NO_X Emissions in France and Sweden: Advanced Fee Schemes versus Regulation," chapter 5 in *Choosing Environmental Policy: Comparing Instruments and Outcomes in the United States and Europe*, Winston Harrington, Richard D. Morgenstern, and Thomas Sterner, eds., Resources for the Future Press: Washington, DC, pp. 117-132.

Hanson, Craig and David Sandalow (2006), "Greening the Tax Code," *Tax Reform and the Environment*, The Brookings Institution.

"Mountains for the centuries," *The Economist*, February 3, 2007, p. 35.

*Parry, Ian W.H., Margaret Walls and Winston Harrington, (2007), "Automobile Externalities and Policies," *Journal of Economic Literature*, 45(2), 373-399.

February 11 – Tradable Permits: theory

Reading: Field, Chapter 13

Bell, Ruth Greenspan, "Are Market-Based Instruments the Right First Choice for Countries in Transition?" *Resources*, Winter 2002, pp. 10-14.

February 16 – Permit Trading Policy in Practice

Reading: Field, Chapter 15

Schmalensee, Richard *et al*., "An Interim Evaluation of Sulfur Dioxide Emissions Trading," *Journal of Economic Perspectives*, vol. 12, Summer 1998, pp. 53-68.

Stavins, Robert N., "What Can We Learn From the Grand Policy Experiment? Lessons From SO_2 Allowance Trading," *Journal of Economic Perspectives*, vol. 12, Summer 1998, pp. 69-88, reprinted in *Readings*.

Sandel, Michael J., "It's Immoral to Buy the Right to Pollute," *The New York Times*, December 15, 1997, reprinted in *Readings*.

Barringer, Felicity, "A Plan to Curb Farm-to-Watershed Pollution of Chesapeake Bay," *The New York Times*, April 13, 2007, p. A10.

Barringer, Felicity and Kate Galbraith, "States Aim to Cut Gases By Making Polluters Pay," *The New York Times*, September 16, 2008, A17, A26.

Mufson, Steven, "Europe's Problems Color U.S. Plans to Curb Carbon Gases," *Washington Post*, April 9, 2007, p. A1.

"Selling hot air," *The Economist*, September 9, 2006, pp. S17-S19.

"Trading thin air," *The Economist*, June 2, 2007, p. S8-S12.

*Ellerman, A. Denny and Barbara K. Buchner (2007), "The European Union Emissions Trading Scheme: Origins, Allocation, and Early Results," *Review of Environmental Economics and Policy*, 1(1), 66-87.

February 18 – Dealing with Risk: Toxins in the Ecosystem

Reading: Field, Chapter 16

Pindyck, Robert S. (2007), "Uncertainty in Environmental Economics," *Review of Environmental Economics and Policy*, 1(1), 45-65.

"Brownfield sites: Muck-spreaders," *The Economist*, April 21, 2001, 26-27.

"Tax or Trade," *The Economist*, February 16, 2002, p. 72.

Take home quiz 1 handed out in class on Wednesday, February 18. Due in Class Monday, February 23.

February 23 – Voluntary Environmental Compliance

Reading: Lyon, Thomas P. and John W. Maxwell (2002), "'Voluntary' Approaches to Environmental Regulation," chapter 4 in *Economic Institutions and Environmental Policy*, Maurizio Franzini and Antonio Nicita, eds., Ashgate Publishing: Aldershot, Hampshire, England.

Daley, Beth, "Not as green as they claim to be," *Boston Globe*, May 14, 2008.

Revkin, Andrew C., "Buying Carbon-Neutral," *The New York Times*, April 29, 2007.

"Eco-warriors at the gate," *The Economist*, March 3, 2007, p. 67-68.

February 25 – Federalism and Environmental Policy

Reading: "Federalism and Environmental Protection: Case Studies for Drinking Water and Ground-Level Ozone," Congressional Budget Office, November 1997.

Adler, Jonathan H., "The Fable of Federal Environmental Regulation: Reconsidering the Federal Role in Environmental Protection," *Case Western Reserve Law Review*, 2004, vol. 55, pp. 93-113.

Barringer, Felicity, "California, Taking Big Gamble, Tries to Curb Greenhouse Gases," *The New York Times*, September 15, 2006, p. A1, A20-A21.

*Bushnell, James, Carla Peterman, and Catherine Wolfram (2007), "Local Solutions to Global Problems: Climate Change Policies and Regulatory Jurisdiction," *Review of Environmental Economics and Policy*, 2(2), 175-193.

IV. Valuing Environmental Benefits & Costs

March 2 – Revealed Preference Approaches

Reading: Field, Chapter 7, pp. 137-151.
Robinson, Lisa A. (2007), "How US Government Agencies Value Mortality Risk Reductions," *Review of Environmental Economics and Policy*, 1(2), 283-299.
Viscusi, W. Kip, "The Value of Life in Legal Contexts: Survey and Critique," *American Law and Economic Review*, 2000, vol. 2, pp. 195-222, reprinted in *Readings*.

Statement of paper topics due in class Monday, March 2

March 4 – Stated Preference Techniques

Reading: Field, Chapter 7, pp. 151-159.
Diamond, Peter A. and Jerry A. Hausman, "Contingent Valuation: Is Some Number Better Than No Number," *Journal of Economic Perspectives*, vol. 8, Fall 1994, pp. 45-64, reprinted in *Readings*.
Hanmeann, W. Michael, "Valuing the Environment Through Contingent Valuation," *Journal of Economic Perspectives*, vol. 8, Fall 1994, pp. 19-43, reprinted in *Readings*.
Portney, Paul R., "The Contingent Valuation Debate: Why Economists Should Care," *Journal of Economic Perspectives*, vol. 8, Fall 1994, pp. 3-17, reprinted in *Readings*.

March 16 – The Costs of Environmental Policies

Reading: Field, Chapter 8
Harrington, Winston, Richard D. Morgenstern, and Peter Nelson, "On the Accuracy of Regulatory Cost Estimates," *RFF Discussion Paper 99-18*.

March 18 & 23 – Making Use of Value Measures – Benefit-Cost Analysis

Reading: Field, Chapter 6
Arrow, Kenneth *et al.*, "Is There a Role for Benefit-Cost Analysis in Environmental, Health, and Safety Regulation?" *Science*, vol. 272, April 12, 1996, pp. 221-222, reprinted in *Readings*.
Goulder, Lawrence H. and Robert N. Stavins, "An eye on the future," *Nature*, vol. 419, October 17, 2002, pp. 673-674, reprinted in *Readings*.
Lee, Jennifer 8., "Second Thoughts on a Chemical: In Water, How Much Is Too Much?" *The New York Times*, March 2, 2004, F1, F4.
Varian, Hal R., "Recalculating the Costs of Global Climate Change," *The New York Times*, December 14, 2006, p. C3.
Wilson, Richard and Crouch, E.A.C., "Risk Assessment and Comparisons: An Introduction," Science, vol. 236, pp. 267-270.
"The price of prudence," *The Economist*, January 24, 2004, S6-S8.

VI. The Environment in Developing Countries

Take home quiz 2 handed out in class on Wednesday, March 25. Due in Class Monday, March 30.

March 25 & 30 – Growth and the Environment

Reading: Dasgupta, Susmita, Benoit Laplante, Hua Wang, and David Wheeler, "Confronting the Environmental Kuznets Curve," *Journal of Economic Perspectives*, Winter 2002, pp. 147-168, reprinted in *Readings*.

Harashima, Yohei, "Effects of Economic Growth on Environmental Policies in Northeast Asia," *Environment*, vol. 42, July/August 2000, pp. 28-40.

Bradsher, Keith, "Clean Air or TV: Paying in Pollution for Energy Hunger," *The New York Times*, January 9, 2007, C1, C9.

Kahn, Joseph and Jim Yardley, "As China Roars, Pollution Reaches Deadly Extremes," *The New York Times*, August 26, 2007.

"How green is their growth," *The Economist*, January 26, 2008, 57-58.

"Survey: Development and the Environment," *The Economist*, March 21, 1998, pp. S1-S16.

"Too hot to touch," *The Economist*, December 1, 2007, p. 90.

"Saving the rainforest," *The Economist*, July 24, 2004, p. 12.

"Asphalt and the jungle," *The Economist*, July 24, 2004, pp. 33-35.

"Down in the woods," *The Economist*, March 25, 2006, pp. 73-75.

"Farming the garden of Eden," *The Economist*, March 25, 2000, pp. S10-S13.

"Liquid assets: where to look for sensible water policies," *The Economist*, July 19, 2003, pp. S13-S15.

"To market, to market," *The Economist*, July 19, 2003, pp. S15-S16.

"The paradox of plenty," *The Economist*, December 24, 2005, pp. 46-47.

April 1 – Sustainable Development

Reading: "The Greening of China," *The Economist*, October 22, 2005, pp. 43-44.

"Working miracles," *The Economist*, July 6, 2002, S13-S15.

Boyd, James W., "What Should Be Counted in Green GDP," *Resources*, Summer 2006, pp. 6-9.

Daly, Herman E., "Operationalizing Sustainable Development by Investing in Natural Capital," chapter 4 in *Beyond Growth*, Beacon Press, Boston, MA, 1996.

Solow, Robert M., "Sustainability: An Economist's Perspective," in *Readings*.

Bradsher, Keith, "Clean Power That Reaps a Whirlwind," *The New York Times*, May 9, 2007, p. C1, C5.

Cowen, Tyler, "A Way for Resource-Rich Countries to Audit Their Way Out of Corruption," *The New York Times*, July 12, 2007, p. C3.

Dean, Cornelia, "To Save Its Canal, Panama Fights for Its Forests," *The New York Times*, May 24, 2005, F1, F4.

"Are you being served," *The Economist*, April 23, 2005, pp. 76-78.

*Lecocq, Frank and Philippe Ambrosi (2007), "The Clean Development Mechanism: History, Status, and Prospects," *Review of Environmental Economics and Policy*, 1(1), 134-151.

*Dasgupta, Susmita, Kïrk Hamiltion, Stefano Pagiola, and David Wheeler (2008), "Environmental Economics at the World Bank," *Review of Environmental Economics and Policy*, 2(1), 4-25.

VII. International Issues

April 6 – International Agreements

Reading: Field, Chapter 21
Bhagwati, Jagdish, "The Case for Free Trade," *Scientific American*, November 1993, pp. 42-49.
Daly, Herman E., "The Perils of Free Trade," *Scientific American*, November 1993, pp. 50-57.
Esty, Daniel C., "Bridging the Trade-Environment Divide," *Journal of Economic Perspectives*, vol. 15, Summer 2001, pp. 113-130.
"Atmospheric pressure," *The Economist*, April 19, 2003, p. 64.
"Emissions suspicions," *The Economist*, June 21, 2008, 88.
"The standard question," *The Economist*, January 15, 2000, p. 79.

April 8 – Global Warming

Reading: Field, Chapter 20, pp. 430-447
McKibbin, Warwick J. and Peter J. Wilcoxen, "The Role of Economics in Climate Change Policy," *Journal of Economic Perspectives*, vol. 16, Spring 2002, pp. 107-129, reprinted in *Readings*.
Pizer, William A., "The Evolution of a Global Climate Change Agreement," *American Economic Review*, 96(2), May 2006, pp. 26-30.
Shelling, Thomas C., "The Cost of Global Warming: Facing the Tradeoffs," *Foreign Affairs*, vol. 76, Nov./Dec. 1997, reprinted in *Readings*.
Gelling, Peter and Andrew C. Rivkin, "Climate Talks Take On Added Urgency After Report," *The New York Times*, December 3, 2007, p. A3.
Lohr, Steve, "The Cost of an Overheated Planet," *The New York Times*, December 12, 2006, C1, C5.
Revkin, Andrew C., "Reports From Four Fronts in the War on Warming," *The New York Times*, April 3, 2007.
"Adapt or die," *The Economist*, September 13, 2008, 67-68.
"Dismal calculations," *The Economist*, September 9, 2006, pp. S14-S17.
"Melting Asia," *The Economist*, June 7, 2008, 29-32.

April 13 – Climate Policy Simulation

VII. Energy and the Environment

April 15 – Energy and the Environment

Reading: Perloff, Jeffrey M., "Exhaustible Resources," *Microeconomics: Fourth Edition*, pp. 562-568.
Mouawad, Jad, "Rising Global Demand for Oil Provoking New Energy Crisis," *The New York Times*, November 9, 2007, p. A1, A24.
Mouawad, Jad, "Oil Innovations Pump New Life Into Old Wells," *The New York Times*, March 5, 2007, p. A1, A11.
Varian, Hal R., "The Rapidly Changing Signs at the Gas Station Show Markets at Work," *The New York Times*, August 24, 2006, p. C3.
"Shock treatment," *The Economist*, November 17, 2007, p. 92.
"Steady as she goes," *The Economist*, April 22, 2006, pp. 65-67.

April 20 & 22 – Alternative Energy Technologies

Reading: Holdren, John P. (2006), "The Energy Innovation Imperative: Addressing Oil Dependence, Climate Change, and Other 21st Century Energy Challenges," *innovations*, pp. 3-23.
Jaffe, Adam B., Richard G. Newell, and Robert N. Stavins, "Technology Policy for Energy and the Environment," in Adam B. Jaffe, Josh Lerner, and Scott Stern, eds., *Innovation Policy and the Economy, vol 4*, MIT Press: Cambridge, MA, pp. 35-68, 2004.
Kammen, Daniel M. and Gregory F. Nemet (2005), "Reversing the Incredible Shrinking Energy R&D Budget," *Issues in Science and Technology*, 22(1), 84-88.
Lander, Mark, "Solar Valley Rises in an Overcast Land," *The New York Times*, May 16, 2008, C1, C7.
Mouawad, Jad, "A Refinery Clears the Air to Grow Roses," *The New York Times*, June 30, 2006, pp. C1, C4.
Revkin, Andrew C., "Budgets Falling in Race to Fight Global Warming," *The New York Times*, October 30, 2006, pp. A1, A14.
Wald, Matthew L., "The Carbon Calculus," *The New York Times*, November 7, 2007, p. H1, H11.
"Evaluating the Role of Prices and R&D in Reducing Carbon Dioxide Emissions," Congressional Budget Office, September 2006.
"Dirty king coal," *The Economist*, June 2, 2007, pp. S22-S24.
"Sunlit uplands," *The Economist*, June 2, 2007, pp. S16-S20.
"The elusive negawatt," *The Economist*, May 10, 2008, 78-80.
"Where to start," *The Economist*, September 9, 2006, pp. S23-S24.

VII. Political Economy

April 27 – The Political Economy of Environmental Policy

Reading: Adler, Jonathan H., "Rent Seeking Behind the Green Curtain," *CATO Regulation*.
Shogren, Jason F., "A Political Economy in an Ecological Web," *Environmental and Resource Economics*, vol. 11, 1998, pp. 557-570.

RESEARCH PAPERS DUE IN CLASS MONDAY, APRIL 27

TAKE HOME FINAL EXAM WILL BE AVAILABLE TO SIGN OUT DURING EXAM WEEK