Course Syllabus

Overview

This economics course examines energy issues that pertain to the environment. The objective is to apply economics to particular issues of energy markets, environmental impacts, investment in renewables, and other energy issues such as transportation and conservation. We will review the economics behind a particular energy issue and then have a discussion about a related article or case study. The class places an emphasis on economics methodology and is intended for students with some economics background. Students are required to have completed the F&ES economics requirement of either the Economics of Natural Resource Management (F&ES 84002a) or the Economics of Pollution (F&ES 84001b).

The course has been structured into four sections. The first section of the course will provide an overview of energy markets. We will begin by reviewing key economic concepts. We will review energy fundamentals such as energy sources, energy uses, and key definitions. The class will examine the economics of extracting nonrenewable resources. We will examine energy market regulation questions like: What are natural monopolies and how are they regulated? What is PURPA? How successful has regulation and deregulation been of oil, natural gas, and electricity markets?

Second, we will look at environmental implications of energy. Here we will discuss some energy-related externalities and examine their regulation. In particular we will ask: What are the externalities of traditional fuel sources like coal? What are some ways that regional pollution has been regulated? What are the economics of climate change?

Next, we will discuss issues of investment in renewable energy sources. We will define the technologies of renewables and consider their private and social costs and benefits. The economics of policies, such as renewable portfolio standards, will be examined. We will ask: What issues matter to investors? Where are renewable portfolio standards being implemented? How effective are portfolio standards likely to be in correcting for externalities?

In the final section, we will examine some other issues in energy economics. We will examine issues of transportation economics like: What are the CAFE standards and what is the regulated firms’ prospective of these standards? We will also discuss issues of inducing energy conservation like: Have demand side management programs been successful?
For each topic, we will begin with a review of some of the key economics concepts that will be useful in examining the issue at hand. The concept will be applied to a short example using qualitative and quantitative techniques. Then, the class will examine a specific application of that week’s topic. The class will discuss an academic article or a case study. Some weeks there will be multiple articles or cases discussed. As described below, students will form groups and at least one group per week will be in charge of leading the discussion.

The class enrollment is limited to 25 students. Students interested in taking the class must register for the class and submit a 1-2 page written statement regarding why they are interested in taking the class.

Office Hours and Teaching Assistants

Office hours: Mondays 2-4pm in 230 Prospect (Room 202)  
Tuesdays 2:30-4:30pm in 55 Hillhouse (Room 301)  
or by appointment
Phone: (203) 432-6233  
E-mail: Erin.Mansur@yale.edu
Class web site: http://classesv2.yale.edu (then MGT 622 / FES 80106)

Teaching assistants: Bailey McCallum and Beth Moore
TA office hours and location:  
Bailey McCallum  Tuesdays noon-1:00 P.M. in SOM Food for Thought  
Beth Moore  Thursdays 2:30-4:30 P.M. in Sage Lounge
TA review hours and location: Mondays 8:00-9:30 P.M. in Sage 32

Readings

I expect that this class will require about ten hours of work per week. The class textbook is:


The textbook (TXT) provides an excellent review of important economics concepts in environmental and natural resource economics. Page numbers are based on the seventh edition though you are welcome to use any edition. Most of the additional readings are either on the class web site (classesv2.yale.edu, CWEB) or are contained in a reading packet (READER), which is available at RIS. The additional articles with web sites (WWW) are not in the reader because they are quite long. You may want to skim them on-line. The readings are meant to provide a mix of perspectives. Those interested in reviewing general microeconomic concepts may consider looking at an edition of Pindyck and Rubinfeld, *Microeconomics*, which is available at the library.
Assignments

Understanding economics requires application. **Four problem sets** will be assigned. The questions will require direct application of concepts discussed in class as well as asking students to apply these concepts to new problems. Students are encouraged to work in groups of two or three to discuss strategy of problem solving. However, write-ups must be done independently.

There will be eight class discussions, approximately one for each topic covered in the class. Every student will be responsible for emailing a question about the reading. In addition, each student will help lead **one of the discussions** at some point in the semester. The discussion leaders will look over the students’ questions and some general ones that I provide, and will prepare written answers to the questions ahead of time. Refer to the syllabus to see the list of topics and readings for the discussions.

In addition, there will be one closed note **take-home test** that will require application of the concepts learned in class. The test will be given out April 2 and will be due April 9 in class. The test should take no longer than three hours to complete.

Finally, students will write a 15 to 20 page **research report** on some energy policy. Students can work in small groups of two or three. The reports will be due by May 11. No late papers will be accepted. Follow the citation guideline in [http://www.dartmouth.edu/7esources/](http://www.dartmouth.edu/7esources/). In addition, during the last three lectures, students will present a summary of their research.

All assignments are due at the beginning of class on the date shown below. Grades will be determined with the following weights:

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Problem sets</td>
<td>15%</td>
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<tr>
<td>Discussion and class participation</td>
<td>15%</td>
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<tr>
<td>Research report presentation</td>
<td>10%</td>
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<tr>
<td>Research report</td>
<td>30%</td>
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<tr>
<td>Take home test</td>
<td>30%</td>
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**DUE DATES**

- **March 7:** One-page research paper proposal.
- **April 9:** Test covering Lectures 1-16.
- **May 11:** Research paper (due by 5:00 P.M. in room 202, 230 Prospect St.).

<table>
<thead>
<tr>
<th>Problem set</th>
<th>Topic</th>
<th>Date</th>
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<tbody>
<tr>
<td>1</td>
<td>Pricing non-renewables</td>
<td>January 31</td>
</tr>
<tr>
<td>2</td>
<td>Regulation and restructuring</td>
<td>February 12</td>
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<tr>
<td>3</td>
<td>Externalities</td>
<td>February 28</td>
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<tr>
<td>4</td>
<td>Climate change</td>
<td>March 28</td>
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COURSE PLAN AND READING LIST

I  OVERVIEW OF ENERGY MARKETS

Chapter 2 on “Valuing the Environment: Concepts.” (TXT)

January 22. Lecture 2: Introduction to energy fundamentals.

Chapter 7 on “The Allocation of Depletable and Renewable Resources.” (TXT)
Chapter 5 on “Sustainable Development: Defining the Concept”. (TXT)

January 29. Lecture 4: Discussion of energy prices and markets.

Chapter 8 on “Depletable, Nonrecyclable Energy Resources.” (TXT)
Problem set 1 due

February 5. Lecture 6: Electricity regulation and restructuring.
II ENVIRONMENTAL IMPLICATIONS OF ENERGY

February 7. Lecture 7: Externalities of conventional fuels.
Chapter 4 on “Property Rights, Externalities, and Environmental Problems” (TXT)
Chapter 3 on “Valuing the Environment: Methods” (TXT)

February 12. Lecture 8: Discussion of externalities.

Problem set 2 due

Chapter 15 on “Economics of Pollution Control: An Overview.” (TXT)
Chapter 17, pages 395-403. (TXT)

February 19. Lecture 10: Discussion of pollution control policies.

The Effect of Federal and State Policies on Traditional Generation Technologies.
Location and time: 230 Prospect (10 – 1).
February 26. Lecture 11: Economics of climate change.

Chapter 17, pages 404-419. (TXT)

http://www.pewclimate.org/docUploads/Pew%20DSynthesis%2EPdf (WWW)

full review available at: http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm (WWW)


BBC articles on Russian ratification of the Kyoto protocol:
http://news.bbc.co.uk/1/hi/sci/tech/3256604.stm (WWW)
http://news.bbc.co.uk/1/hi/world/europe/3957717.stm (WWW)
http://news.bbc.co.uk/1/hi/world/europe/3985669.stm (WWW)


Pew Center on Global Climate Change. 2003. “Beyond Kyoto: Advancing the International Effort Against Climate Change,”
http://www.pewclimate.org/docUploads/Beyond%20Kyoto%2EPdf (WWW)

Problem set 3 due

March 5. Lecture 13: Discussion of Climate Change.


III INVESTMENT IN RENEWABLE ENERGY SOURCES

March 7. Lecture 14: Overview of renewable technology.

World Energy Assessment, pages 219-305.


One-page research paper proposal due.
March 12-23. Spring Break – No class.

March 26. Lecture 15: Discussion of investing in energy projects.

   (Guest Lecture: Bryan Garcia, Yale University)
   Problem set 4 due

April 2. Lecture 17: Discussion of Policies for Renewables.

IV OTHER ISSUES IN ENERGY ECONOMICS


  Policies of energy efficiency. Location and time TBA.
  
  Take home test due

April 11. Lecture 20: Introduction to transportation economics.
  Chapter 18 on “Mobile-Source Air Pollution” (TXT)

April 16. Lecture 21: Discussion of CAFE and transportation policies.

April 18. Lecture 22: Discussion of other transportation policies.

April 23. Group presentations

April 25. Group presentations

April 30. Group presentations

May 11. Research paper due by 5pm at 230 Prospect.