

Econ 132  
Energy Economics  
University of California, San Diego  
Summer 2013

## Syllabus

Lectures: Monday and Wednesday 11am to 1:50pm in WLH 2113

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### *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. 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. 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. In the final section, we will examine some **other issues in energy economics**.

### *Readings*

Thomas Tietenberg and Lynne Lewis. *Environmental and Natural Resource Economics*, 8<sup>th</sup> edition, (Boston, MA: Addison Wesley, 2006).

The textbook (TXT) provides an excellent review of important economics concepts in environmental and natural resource economics. Page numbers are based on the 8<sup>th</sup> edition though you are welcome to use any edition. Those interested in reviewing general microeconomic concepts may consider looking at an edition of Pindyck and Rubinfeld, *Microeconomics*.

## *Assignments*

Understanding economics requires application. There will be approximately **three problem sets**. Assignments will not be due but the exams will draw heavily from these assignments.

Midterm 1 will be on Monday, July 15 in class and Midterm 2 will be on Wednesday, July 31. The paper is due Friday, August 2 by 11:45. These dates are not negotiable.

Grades will be determined using the following weights:

Paper	10%
Midterm 1	40%
Midterm 2	50%

No makeup exams will be given. Once you start taking an exam, the test counts. Under no circumstances can you have your test results not count once you start taking it. You do not need blue books. Exams are electronics free except for the use of a BASIC calculator. No cell phones, no ipods, no headphones, etc. You also may not wear sunglasses or hats on test day.

If you arrive late to an exam, I will allow you to take the exam in the time that remains as long as no one has turned in his/her exam and left the room. Once a classmate has turned in his/her exam, you will earn a zero on the test if you arrive late.

The marking scheme on this syllabus is final. Under university regulations, the posted marking scheme applies to all students without exceptions. There is no dropping an exam or extra credit of any kind. Please make sure you are well prepared for both exams. Grades are determined on a curve.

## Academic Dishonesty

There is a zero tolerance policy in this class for academic dishonesty. Any student found guilty of academic dishonesty will receive an F in the course. If you are unsure what constitutes academic dishonesty, please ask or consult with your college dean. In all cases, the student's name and test or exam will be immediately forwarded to the Academic Integrity Office, who will impose an additional penalty, up to and including expulsion from the university. Please do not even consider cheating, it is not worth it and you will not be given a second chance.

If you have a documented disability, please come to talk to me as soon as possible so that I can make suitable accommodations for you.

You are responsible for all material discussed in class and in the readings. If you miss a class, please get the notes from a classmate.

## COURSE PLAN AND READING LIST

### I OVERVIEW OF ENERGY MARKETS

Introduction.

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

Introduction to energy fundamentals.

Kenneth S. Deffeyes. 2001. *Hubbert's Peak: The Impending World Oil Shortage*, Chapter 1. Available on line at <http://pup.princeton.edu/chapters/s7121.pdf> (WWW)

Pricing of exhaustible resources.

Chapter 5 on "Dynamic Efficiency and Sustainable Development". (TXT)

Chapter 7 on "The Allocation of Depletable and Renewable Resources: An Overview." (TXT)

Discussion of energy prices and markets.

William Nordhaus, "The Allocation of Energy Resources," Brookings Papers, No. 3 (1973), pp. 529-570. <http://cowles.econ.yale.edu/P/cp/p04a/p0401.pdf> (WWW)

Economic regulation of energy markets.

Chapter 8 on "Energy: The Transition from Depletable to Renewable Resources." (TXT)

Electricity regulation and restructuring.

Severin Borenstein. 2002. "The Trouble with Electricity Markets: Understanding California's Restructuring Disaster," *UC Energy Institute Power Working Paper PWP-081* (published in *Journal of Economic Perspectives*, 16).

Peter Van Doren and Jerry Taylor. 2004. "Rethinking Electricity Restructuring" Cato Institute Policy Analysis No. 530. <http://www.cato.org/pubs/pas/pa530.pdf> (WWW)

### II ENVIRONMENTAL IMPLICATIONS OF ENERGY

Externalities of conventional fuels.

Chapter 3 on "Valuing the Environment: Methods" (TXT)

Chapter 4 on "Property Rights, Externalities, and Environmental Problems" (TXT)

Discussion of externalities.

Kip Viscusi, Wesley Magat, Alan Carlin, and Mark Dreyfus. 1994. "Environmentally Responsible Energy Pricing," *The Energy Journal*, 15(2): 23-42.

Nicholas Muller and Robert Mendelsohn. 2007. "Measuring the damages of air pollution in the United States," *Journal of Environmental Economics and Management*, 54: 1-14.

Kumar, Surender and D. Rao. 2001. "Valuing The Benefits of Air Pollution Abatement Using a Health Production Function: A Case Study of Panipat Thermal Power Station, India," *Environmental and Resource Economics*, vol. 20, no. 2, October 2001, pp. 91-102. (CWEB)

## Economics of pollution control.

Chapter 15 on "Economics of Pollution Control: An Overview." (TXT)

Chapter 17, pages 413-421. (TXT)

## Discussion of pollution control policies.

US Environmental Protection Agency. "Acid Rain Program 2005 Progress Report,"  
<http://www.epa.gov/airmarkets/progress/docs/2005report.pdf>

## Economics of climate change.

Chapter 17, pages 421-435. (TXT)

Joel Smith. 2004. "A Synthesis of Potential Climate Change Impacts on the U.S."  
<http://www.pewclimate.org/docUploads/Pew%2DSynthesis%2Epdf> (WWW)

HM Treasury. 2007. "Stern Review: The Economics of Climate Change" Executive Summary. January.

full review available at: [http://www.hm-treasury.gov.uk/independent\\_reviews/stern\\_review\\_economics\\_climate\\_change/sternreview\\_index.cfm](http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm) (WWW)

## Introduction to climate change policies.

Kimberly O'Neill Packard and Forest Reinhardt. 2000. "What Every Executive Needs to Know About Global Warming," *Harvard Business School Case*: R00409.

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)

Warick McKibbin and Peter Wilcoxon. 2002. "The Role of Economics in Climate Change Policy," *Journal of Economic Perspectives*, Winter. 16(2): 107-129.

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)

### **III INVESTMENT IN RENEWABLE ENERGY SOURCES**

#### Overview of renewable technology.

World Energy Assessment, pages 219-305.

<http://www.energyandenvironment.undp.org/undp/index.cfm?module=Library&page=Document&DocumentID=5037> (WWW)

Duncan Austin and Craig Hanson. 2002. "Introducing Green Power for Corporate Markets: Business Case, Challenges, and Steps Forward,"

*World Resource Institute Corporate Guide to Green Power Markets #1.*

#### Discussion of Policies for Renewables.

Carolyn Fisher and Richard Newell. 2003. "Environmental and Technology Policies for Climate Change and Renewable Energy," *Resources for the Future Discussion Paper.*

#### **IV OTHER ISSUES IN ENERGY ECONOMICS**

Energy efficiency and conservation.

Amory Lovins and Chris Latspeich. 1999. "Energy Surprises for the 21st Century," *Journal of International Affairs*, 53(1). 14 pages.

Auffhammer, Maximilian, Carl Blumstein, and Meredith Fowlie. 2007. "Demand-Side Management and Energy Efficiency Revisited," March 2007 WP-165  
<http://www.ucei.berkeley.edu/PDF/csemwp165.pdf> (WWW)

Introduction to transportation economics.

Chapter 18 on "Mobile-Source Air Pollution" (TXT)

Delucchi, M. 2000. "Environmental Externalities of Motor-Vehicle Use in the U.S." *Journal of Transport Economics and Policy*, vol. 34 (2), pp. 135-168.

Parry, Ian W H and Kenneth A. Small. 2005. "Does Britain or the United States Have the Right Gasoline Tax?" *American Economic Review*, 95(4): 1276-1289.

Discussion of CAFE and transportation policies.

Paul Portney, *et al.* 2003. "Policy Watch: The Economics of Fuel Economy Standards," *Journal of Economic Perspectives*, 17(4): 203-17.

Please note that there is a lot of information contained in this reading list and that it may be modified at the instructor's discretion at any time. It is unlikely that we will make it through all of this material this quarter.