

## **Strategy 738: Sustainable Energy Futures**

**Professor Thomas P. Lyon**

Winter 2009

Tuesday 6:30 – 9:30 p.m.

Ross E0550

Office Hours (Ross 6366): Tuesday 2:30 – 4 p.m.

### **INTRODUCTION**

Energy is the lifeblood of industrial economies, but also a key factor in environmental and national security problems. Because of the extensive externalities associated with energy use, and the uneven distribution of energy resources around the globe, balancing the benefits and costs of energy use is one of the major challenges facing humanity. This balancing act involves crafting a mix of markets and regulations that will align the incentives of businesses and individuals with the greater good of people and the planet. But do our institutions really accomplish this goal? And can they cope with the massive increase in energy use expected in developing countries over the next two decades?

In most developed countries, the marketplace plays the predominant role in determining what energy sources are used, and how. But government policy plays an extremely important role, as well---governments at the local, state, regional, national, and international levels all mold aspects of energy policy. In addition, non-governmental organizations (NGOs) of all sorts affect our energy choices, either by influencing government policy or influencing corporate behavior directly. In developing countries, government often controls most supplies of non-renewable energy resources, as well as the development of the infrastructure needed to exploit energy resources.

Using the building blocks of STRAT 737, this course will explore in more detail some of the specific technological, market and policy issues involved in making the transition to a sustainable energy future.

*The goal of this course is to give you a solid grasp of the markets and politics surrounding energy use, so that you can play a more effective role in shaping future policy or business decisions.*

*Prerequisites: STRATEGY 737*

Your course grade is based on four components:

Short Papers	25%
Debate Performance	30%
Class Participation	10%
Final Project	50%

### *Short Paper*

As part of a team of 4-5 students, you will write a short (5 page) paper critiquing a current proposal for achieving economic growth through government support of a green economy.

### *Debates.*

As part of a team of 4-5 students, you will take part in one of several class debates.

- You will write a short position paper (2-3 pages) as part of a group for one of the class debates. (15% of grade) You will have a chance to select from a list of possible topics, but you will be assigned to debate one side or the other.
- Your performance in one of the debates. (15%) You will have a chance to sign up for your preferred topic, although you are not guaranteed to get your first choice. In class, one student will be selected randomly to present a 5-minute opening speech affirming the proposition for the day, then a second student will be randomly selected to present the negative case. Following that, other students will have an opportunity to offer rebuttal or surrebuttal arguments and closing statements. Class will then vote on which team won the debate.
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### *Class Participation*

I expect students to come to class having done the reading and prepared to engage in discussion. Your contribution toward the quality of class discussion will account for 10% of your grade.

*Final Project:* You will work in teams on a topic you select in consultation with me. A team should have 4 members. Your paper should **be at most 15 pages (Double spaced; font size 12; one-inch margins) of text, with no more than 10 additional pages of exhibits.** A title page does not count towards the page requirement. My evaluation of your work will be based primarily on the analysis in the main body of the paper.

- **March 17: 1-page topic proposal is due. Please be prepared to briefly describe your proposal to the class.**
- **April 10 in class: Poster Session presenting your findings (This will count for 10% of your overall grade.)**
- **April 18, 5 p.m.: Final paper is due (The paper will count for 25% of your final grade).**

## Overview of Weekly Topics

Items highlighted in bold are required reading for the class; the others are supplemental.

### 1. March 10: Energy Security

- **NCEP Report, section 1, “Enhancing Oil Security,” pp. 1-18.**
- **WEA, Chapter 4, “Energy Security”**
- **Ian Parry and Joel Darmstadter, “The Costs of US Oil Dependency,” RFF Discussion Paper 03-59. <http://www.rff.org/Documents/RFF-DP-03-59.pdf>**
- George Horwich and David Leo Weimer, “The Costs of Disruption under a Free Market,” Chapter 2, in *Oil Price Shocks, Market Response, and Contingency Planning*, Washington, DC: American Enterprise Institute, 1984.
- George Horwich and David Leo Weimer, “The Strategic Petroleum Reserve,” Chapter 4, in *Oil Price Shocks, Market Response, and Contingency Planning*, Washington, DC: American Enterprise Institute, 1984.

### Price controls

- **W. Kip Viscusi, John M. Vernon, and Joseph E. Harrington, Jr., “Economic Regulation of Energy: Crude Oil and Natural Gas,” Chapter 18 of *Economics of Regulation and Antitrust*, Cambridge, MA: The MIT Press, 1998.**
- **Joseph P. Kalt, “The Creation, Growth, and Entrenchment of Special Interests in Oil Price Policy,” Chapter 6 in Roger G. Noll and Bruce M. Owen, editors, *The Political Economy of Deregulation: Interest Groups in the Regulatory Process*, Washington, DC: American Enterprise Institute, 1983.**
- George Horwich and David Leo Weimer, “The Impact of Petroleum Market Regulations, 1973-1981,” Chapter 3, in *Oil Price Shocks, Market Response, and Contingency Planning*, Washington, DC: American Enterprise Institute, 1984.
- M. Elizabeth Sanders, “Regulating Producers,” Chapter 5 of *The Regulation of Natural Gas: Policy and Politics 1938-1978*, Philadelphia, PA: Temple University Press, 1981.
- Stephen Breyer, “Mismatch: Rent Control and Natural Gas Field Prices,” Chapter 13 in *Regulation and Its Reform*, Cambridge, MA: Harvard University Press, 1982.

### 2. March 17: Energy Efficiency

- **Amory Lovins, *Winning the Oil Endgame***
- **Kenneth Gillingham, Richard Newell, and Karen Palmer, “The Effectiveness and Cost of Energy Efficiency Programs,” *Resources*, Fall 2004, pp. 22-25, <http://www.rff.org/Documents/RFF-Resources-155-energyefficiency.pdf>**
- **Gilbert E. Metcalf and Kevin Hassett, “Measuring the Energy Savings from Home Improvement Investments: Evidence from Monthly Billing Data,” *Review of Economics and Statistics*, August 1999, pp. 516-528.**

- **Adam Jaffe, Richard Newell, and Robert Stavins, “Energy-Efficient Technologies and Climate Change Policies: Issues and Evidence,” Resources for the Future Discussion Paper, December 1999.**
- Thomas E. Copeland and Philip T. Keenan, “How Much is Flexibility Worth?,” *The McKinsey Quarterly*, 1998, #2.
- Thomas E. Copeland and Philip T. Keenan, “Making Real Options Real,” *The McKinsey Quarterly*, 1998, #3.
- James E. Smith and Robert F. Nau, “Valuing Risky Projects: Option Pricing Theory and Decision Analysis,” *Management Science*, 1995, 41: 795-816.
- Kenneth Gillingham, Richard Newell, and Karen Palmer, “Retrospective Examination of Demand-Side Energy Efficiency Programs,” RFF Discussion Paper 04-19 rev, <http://www.rff.org/Documents/RFF-DP-04-19REV.pdf> .
- William H. Golove and Joseph H. Eto, “Market Barriers to Energy Efficiency: A Critical Reappraisal of the Rationale for Public Policies to Promote Energy Efficiency,” Lawrence Berkeley Laboratory, March 1996, <http://eetd.lbl.gov/ea/ems/reports/38059.pdf>
- Adam B. Jaffe and Robert N. Stavins, “The energy paradox and the diffusion of conservation technology,” *Resource and Energy Economics*, 1994, 16: 91-122.

### 3. March 24: Climate Change

#### Voluntary Programs for Climate Mitigation

- **Delmas, Magali A. and Maria J. Montes-Sancho. 2007. “Voluntary Agreements to Improve Environmental Quality: Are late joiners the free riders?,” University of California, Santa Barbara, ISBER Paper 07.**
- **Thomas P. Lyon and Eun-Hee Kim, “Greenhouse Gas Reductions or Greenwash? The DOE’s 1605b Program,” mimeo, Stephen M. Ross School of Business, University of Michigan.**
- **Thomas P. Lyon and John W. Maxwell, “Public Voluntary Programs for Mitigating Climate Change,” in Andrea Baranzini and Philippe Thalmann, editors, *Voluntary Agreements in Climate Policies*, Edward Elgar Press, 2004.**
- Haddad, Brent M., Richard Howarth, and Bruce Paton. (2003) “Energy Efficiency and Greenhouse Gas Emissions: Correcting Market Failures using Voluntary Participation Programs,” in Andrea Baranzini and Philippe Thalmann, editors, *Voluntary Agreements in Climate Policies*, Edward Elgar.
- Karamanos, Panagiotis. 1999. “Voluntary Environmental Agreements for the Reduction of Greenhouse Gas Emissions: Incentives and Characteristics of Electric Utility Participants in the Climate Challenge Program,” working paper, School of Public and Environmental Affairs, Indiana University.
- Lyon, Thomas P. and John W. Maxwell, (2003) “Self-Regulation, Taxation, and Public Voluntary Environmental Agreements, *Journal of Public Economics*.

### 4. March 31: Promoting Renewables for Electricity Production

- **Joel Darmstadter, “The Economic and Policy Setting of Renewable Energy: Where Do We Stand?,” Resources for the Future Discussion Paper 03-64, December 2003.**
- **Karen Palmer and Dallas Burtraw, “Cost-Effectiveness of Renewable Electricity Policies,” Resources for the Future Discussion Paper 05-01, January 2005.**
- **Carolyn Fischer and Richard Newell, “Environmental and Technology Policies for Climate Change and Renewable Energy,” RFF Discussion Paper, September 2003.**
- **Robert J. Michaels, “Intermittent Currents: The Failure of Renewable Electricity Requirements,” mimeo, California State University, Fullerton.**
- **David Berry, “The Market for Tradeable Renewable Energy Credits,” *Ecological Economics*, 2002, 42: 369-379.**
- **Trent Berry and Mark Jaccard, “The Renewable Portfolio Standard: Design Considerations and an Implementation Survey,” *Energy Policy*, 2001, 29: 263-277.**
- **Marc Chupka, “Designing Effective Renewable Markets,” *The Electricity Journal*, May 2003, pp. 46-57.**
- **Angus Duncan, “Green Tags...the What, Why and How Of,” Bonneville Environmental Foundation, April 2001.**
- **Lori Bird, Ed Holt, and Ghita Carroll, “Implications of Carbon Regulation for Green Power Markets,” National Renewable Energy Laboratory, Technical Report NREL/TP-640-41076, April 2007.**
- **Ryan Wiser and Steven Pickle, “Financing Investments in Renewable Energy: The Role of Policy Design and Restructuring,” Lawrence Berkeley National Laboratory, LBNL-39826, march 1997.**
- **Edward A. Holt and Ryan H. Wiser, “The Treatment of Renewable Energy Certificates, Emissions Allowances and Green Power Programs in State Renewables Portfolio Standards,” Environmental Energy Technologies Division, Lawrence Berkeley Laboratory, April 2007**

5. April 7: Guest Speaker: Sustainable Mobility

- **Ian Parry, Carolyn Fischer, and Winston Harrington, “Should CAFÉ Standards be Tightened?,” RFF Discussion Paper, December 2004.**
- **Andrew Kleit, “The Impact of Long-Range Increases in the CAFÉ Standard,” Working Paper, Pennsylvania State University, 2002.**
- **Andrew Kleit and Randall Lutter, “Increasing CAFÉ Standards: Still a Very Bad Idea,” AEI/Brookings Joint Center Regulatory Analysis, June 2004.**
- **Paul Portney, Ian Parry, Howard Gruenspecht, and Winston Harrington, “The Economics of Fuel Economy Standards,” *Journal of Economic Perspectives*, 2003, 17: 203-217.**
- **Partnership for a New Generation of Vehicles**
- **Energy Future Coalition/Transportation Working Group, “Analysis of Tax Credits to Stimulate Consumer Demand for Advanced-Technology, Fuel-Efficient Vehicles,” July 31, 2003.**

- Environmental Defense, “Automakers’ Corporate Carbon Burdens: Update for 1990-2003,” August 2005
- World Business Council for Sustainable Development, “Mobility 2001: World Mobility at the End of the Twentieth Century and Its Sustainability”
- **Edward A. Parson and Jennie C. Stephens, “Reducing Automobile Emissions: Strategy and Technology,” Working Paper for chapter in book *Feasible Improvements: Technological uncertainty and strategic behavior in environmental regulation***

6. April 14: **Student Project Poster Session**