

ECO 314S: Energy and the Environment

CALENDAR DESCRIPTION:

This course surveys important features of energy markets and related environmental challenges. One of the central objectives is to provide an understanding of the key economic tools needed to analyse these markets. A related objective is the development of a framework for understanding the public discourse on energy and the environment. Topics include the hydrocarbon economy (oil, natural gas and coal), electricity markets, global warming and other externalities, renewable energy, conservation, carbon taxes and 'cap-and-trade'.

Prerequisites: ECO200Y1/ECO204Y1/ECO206Y1,
ECO220Y1/ECO227Y1/(STA247H1,STA248H1)/(STA250H1,STA255H1)/(STA257H1,STA261H1)
Distribution Requirement Status: This is a Social Science course
Breadth Requirement: Society and its Institutions (3)

LOCATION AND TIME: Wednesday 2-5. UC 179

EVALUATION:

Midterm	35%	Wednesday October 17, 2012.
Final Exam	35%	Exam period.
Problems	30%	Due Tuesday Dec 4, 2012. Late submissions penalized 10% for each day late.

You are required to submit solutions to all problems. However, only a subset of problems will be graded. The list of problems that are to be graded will not be revealed in advance. Problems sets will be submitted electronically, details to follow.

The only generally acceptable reason for missing a term test is illness. A medical certificate is required under such circumstances. We are asked to remind you that plagiarism and cheating are **serious** academic offences with potentially serious penalties.

LECTURE TOPICS

1. Background and Introduction
2. Economic Tools: Theory and Empirical Analysis
3. Environmental Issues
4. Regulation and Government Intervention
5. Renewables
6. Oil
7. Natural Gas
8. Coal
9. Electricity
10. Networks

COURSE OBJECTIVES

1. Broad overview of major areas of energy economics and related environmental issues.
2. Understanding of important economic tools used to analyse energy markets.
3. Develop capacity to understand public discourse and critically assess energy and environmental debates, (e.g., decarbonization, fracking, renewable energy, markets v. regulation ...).
4. Facility with vast data resources on energy and related environmental issues.

COURSE MATERIALS

Required:

David Buchan, *The Rough Guide to the Energy Crisis*, Rough Guides, 2010.

Recommended:

Daniel Yergin, *The Quest*, The Penguin Press, 2011

Joseph Dukert, *Energy*, Greenwood Press, 2009.

Additional References:

Carol Dahl, *International Energy Markets*, PennWell, 2004.

Subhes Bhattacharyya, *Energy Economics*, Springer, 2011.

READINGS AND SOURCES

1. International Energy Agency, <http://www.iea.org/>
 - a. *Energy Statistics Manual*
 - b. *Electricity Information 2011, IEA Statistics*
 - c. *2011 Key World Energy Statistics*
2. National Energy Board (Canada)
 - a. *Canadian Energy Overview 2011, Energy Briefing Note* (July 2012)
 - b. *Understanding Canadian Shale Gas* <http://www.neb-one.gc.ca/clf-nsi/rnrgynfmtn/nrgyrprt/ntrlgs/prmrndrstndngshlgs2009/prmrndrstndngshlgs2009nrgbrf-eng.html>
3. Government of Ontario, *Green Energy and Green Economy Act, 2009*, http://www.ontla.on.ca/web/bills/bills_detail.do?BillID=2145 .
4. Lawrence Livermore Laboratories <https://energy.llnl.gov/>.
 - a. Energy flow charts
 - b. Carbon flow charts
5. MIT Energy Initiative
 - a. *The Future of Natural Gas. An Inter-disciplinary MIT Study*, 2011, <http://web.mit.edu/mitei/research/studies/naturalgas.html>.

- b. *The Future of Coal. An Inter-disciplinary MIT Study*, 2007, <http://web.mit.edu/mitei/research/studies/coal.shtml>.
 - c. *The Future of the Electricity Grid: An Interdisciplinary MIT Study*, 2011, <http://web.mit.edu/mitei/research/studies/the-electric-grid-2011.shtml>.
- 6. BP <http://www.bp.com/sectionbodycopy.do?categoryId=7500&contentId=7068481> (formerly British Petroleum)
 - a. *BP Statistical Review of World Energy 2012*
 - b. *Statistical_review_of_world_energy_full_report_2012.xlsx*
- 7. Her Majesty's Treasury, *Stern Review on the Economics of Climate Change*, 2006, Executive Summary.
- 8. Green, R. and A. Yatchew 2012: "Support Schemes for Renewable Energy: An Economic Analysis", *Economics of Energy & Environmental Policy*, 1, 83-98.
- 9. Yatchew, A. and A. Baziliauskas 2011: "Ontario Feed-In Tariff Programs", *Energy Policy*, 39, 3885-3893.
- 10. Economists' Voice, The Berkeley Economic Press.
 - a. Stiglitz, J. 2006, "A New Agenda for Global Warming"
 - b. Arrow, K. 2007, "Global Climate Change: A Challenge to Policy"
 - c. Schelling, T. 2007, "Climate Change: The Uncertainties, the Certainties, and What They Imply About Action"
- 11. Socolow, R. and S. Pacala
 - a. "A Plan to Keep Carbon in Check", *Scientific American*, pp. 50-57. September 2006.
 - b. "Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies", *Science*, Vol. 305, pp. 968-72, 2004.