

Political Science 340
Energy Policy
Fall 2009

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Office Hours: T – 1:00-2:00, W 10:00-11:00, Th 1:00-2:00 and by appointment

Human history can be divided into three distinct successive phases. The first, comprising all history prior to about 1800, was characterized by a small human population, a low level of energy consumption per capita, and very slow rates of change. The second, based upon the exploitation of fossil fuels and the industrial metals, has been a period of continuous and spectacular exponential growth. However, because of finite resources of the earth's fossil fuels and metallic ores, the second phase can only be transitory. Most of the ores of the industrial metals will have been mined within the next century. The third phase, therefore, must again become one of the low rates of growth, but initially with a large population and a high rate of energy consumption. Perhaps the foremost problem facing mankind at present is that of how to make the transition from the present exponential growth phase to the near steady state of the future by as noncatastrophic a progression as possible.

- - M. King Hubbert

Introduction and Goals of the Course

The fundamental human issue concerning energy is societies use energy to do work, produce goods and meet the basic needs and demands of their members. Choices societies make in this regard have profound implications for patterns of human settlement, the structure of social life, the distribution of income, and allocations of political power. Recently, people have also begun to recognize implications for the viability of the environment and conditions of human health. Some commentators have even expressed concerns that choices of energy technologies will affect levels of personal freedom and the possibilities of democratic government.

These issues came into clear relief during the “energy crises” of the 1970s when significant short-term disruptions of energy supplies prompted public debate focused on making rational energy choices for the long term, with considerable attention paid to the social, economic and political implications of those choices. Three decades of market ideology, robust aggregate economic growth, globalization of the economy, new telecommunications technologies and the end of the Cold War obscured that debate, however. A combination of environmental concerns, wars in the Middle East, the spread of terrorism, escalating military activity around access to oil and most importantly rising energy prices have thrust these issues back before a too often complacent American population. As these issues deserve serious attention, the course objects are as follows:

- To help students understand the concepts that structure debates about energy use and policy choice regarding the sources and end-uses of energy in the U.S. and globally

- To develop a sense of the interrelationships between the choices of energy technologies and the social, economic and political characteristics of a society.
- To expose students to the physical, economic and political dimensions of the choices that societies have available to them.
- To explore the current position that energy holds on the public policy agenda including a look at significant domestic and international conflicts connected to the use of energy.
- To have students consider the best path for future energy development and use, including consideration of normative and ethical questions in that regard.

Attendance

Students are expected to attend all classes. Absences due to participation in legitimate Moravian College extracurricular activities, a doctor's excuse or notification by the Dean of Students Office will allow a student to be excused from class. All other excuses are subject to the instructor's judgment.

Texts

Michael Klare, **Rising Powers, Shrinking Planet: The New Geopolitics of Energy**, (New York, NY: Henry Holt & Company, 2008)

Fred Krupp and Miriam Horn, **Earth: the Sequel**, (New York, NY: W.W. Norton, 2009)

David Nye, **Consuming Power**, (Cambridge, MA: MIT Press, 1998)

Vaclav Smil, **Energy at the Crossroads**, (Cambridge, MA: MIT Press, 2004)

Evaluation of Student Work

The final grade will be based on a 300 point system. Final grades will be assigned according to the following scoring:

GRADE	POINTS	GRADE	POINTS
A	285	C	225
A-	270	C-	210
B+	264	D+	204
B	255	D	195
B-	240	D-	180
C+	234	F	<180

The scores will be determined through set of out of class writing assignments, an energy journal and the instructor's evaluation. The essay questions and descriptions of other assignments, their point value and the due dates for each are listed below.

Essays

Students will complete five of the following seven essays. All students will do essay number 7. From the remaining essays, students will need to choose two of the 50 point essays (numbers 2, 3, and 5) and two of the 25 point essays (numbers 1, 4, and 6).

Evaluation of these essays will be based on the following criteria:

- Clarity and directness in answering the question
- Concreteness in development of arguments or essential principles
- Evidence of understanding of key concepts
- Evidence of use of reading and class materials
- Use of additional research beyond materials assigned for class

Because good writing requires multiple drafts and revisions, students will be allowed to do multiple drafts of one of the following essays: 2, 3, 4, or 5. The student should submit the paper at least one class periods *before* the due date of the paper and will have one week *after* the paper has been returned to revise it. The original paper must be resubmitted with the revised.

Essay 1 – David Nye argues that the “meanings” of technologies are “socially constructed” and that the consequences of technological choice are not inherently “determined.” What does Nye mean by these assertions and, according to Nye, what is the relationship between human choice of technology and our material environment and culture? **{2 to 3 typewritten pages} (25 points)**
DUE DATE: 9/10

Essay 2 - A major premise of the course is that energy is of great importance because of its connection to work both as physical and economic activity. Discuss what you have learned from class and the readings scheduled between 9/8 and 9/15 to demonstrate that you understand how energy represents work and the types of work for which energy is used. Make sure to include a discussion of the significant physical and mathematical principles discussed in the course that govern the availability of energy used to perform work. **{4 to 7 typewritten pages} (50 points)**
DUE DATE: 9/22

Essay 3 – David Nye’s history of energy in America describes how energy use impacted numerous social and cultural conditions including:

- settlement patterns
- industrial organization
- domestic life and lifestyle
- popular culture and entertainment

Using the material in **Consuming Power**, discuss one example of each of these conditions (for a total of four different examples) and show how energy was a key variable in the historic development of such conditions in the United States. Each of the four examples to be discussed should be chosen from a different chapter in Nye’s book. **{5 to 7 typewritten pages} (50 points)**
DUE DATE: 10/1

Essay 4 – What are market failures? Give examples. Identify and describe four possible policy options that government can use to respond to them? **{3 to 5 typewritten pages} (25 points)**

DUE DATE: 10/15

Essay 5 – Discuss the geopolitical context of energy in the 21st century and how both past and current U.S. foreign policies have shaped current conditions. **{5 to 7 typewritten pages} (50 points) DUE DATE: 10/27**

Essay 6 – What is the issue of reliability in our electric power system? Why is it an issue of regulation and restructuring? How is it affected by the prospects of distributed generation? **{3 to 4 typewritten pages} (25 Points) DUE DATE: 11/5**

Essay 7 – Imagine yourself to be a time traveler who goes back in time to 1950. Upon arriving, you decide to write a letter to the White House Chief of Staff describing the energy problems that face 21st century America. The intent of the letter is to alert the United States to the problems that are coming, how they came to be and possible actions that could be implemented to avoid or rectify the problems at hand today. **{8 to 15 typewritten pages} (100 points) DUE DATE: Final Exam Date**

Energy Journals (20 points) - DUE DATE 11/17

Students will submit a typewritten report on how they used energy during the week of November 8 through November 14. These journals will have eight entries. Seven of these entries will be a record of the ways that the student consumed energy during a given day and **an identification of the energy resource that was consumed in that activity**. The eighth entry will be student commentary reflecting on the record established in the journal. This commentary could focus on any of the topics in the course. The commentary could include normative judgments on lifestyle, implications for public policy, lessons learned by the individual about energy use, or a discussion of an event or activity that yielded noteworthy insight about the issues raised by the course.

Instructor Evaluation (30 points)

Instructor evaluation will be based on participation in class discussion as well as attendance, completing assignments on time and other indications of effort and commitment to the course.

Course Topics and Reading Assignments:

1. Introduction (9/1)
2. Philosophy of Technology: Technological Determinism, Technological Momentum and the Social Construction of Technology (9/3) **Read:** Nye, “Introduction,” pp. 1-14; Smil, pp. 1-31
3. Energy and the Economy: work, demand, end use, levels of consumption, presumptions about correlation between energy use and growth (9/8) **Read:** Smil, pp. 49-120 and

Department of Energy, **Energy Perspectives: 1949-2008**, available at http://www.eia.doe.gov/aer/ep/ep_frame.html

4. Supply and the problem of exponential growth (9/10) **Read:** A. Bartlett, “Forgotten Fundamentals of the Energy Crisis,” **American Journal of Physics**, September 1978, available at http://www.npg.org/specialreports/bartlett_index.htm
5. Thermodynamics, entropy and end use (9/15) **Read:** David Goodstein, “Heat Engines and Entropy,” from **Out of Gas**, (New York: W.W. Norton, 2004) to be distributed in class; in class video, David Goodstein, Watson Lecture, California Institute of Technology, 10/13/2004, at <http://today.caltech.edu/theater/item?story%5fid=5602>
6. Social consequences of energy use: energy use in the 19th Century (9/17) **Read:** Nye, Chapters 1-4
7. Energy and the social consequences of industrialization, urbanization, and suburbanization in the 20th Century (9/22) **Read:** Nye, Chapters 5-6
8. The energy crisis and responses to it. (9/24) **Read:** Nye, Chapters 7-9; Krupp and Horn, Chapter 1
9. The Policy Process (9/29-10/6) **Read:** Marcia Clemmitt, “Energy and Climate,” **CQ Researcher**, July 24, 2009 • Vol. 19, Issue 26, available at <http://library.cqpress.com/cqresearcher/document.php?id=cqresrre2009072400>
 - a. Markets and Government: political economy, market failures and public goods (9/29)
 - b. The Policy Process: Institutional variables in the policy process: separation of powers, delegation of authority, federalism and interest group liberalism (10/1)
 - c. The Policy Process: Policy options (10/6)
10. Oil (10/8 – 10/20) **Read:** Michael Klare, **Rising Powers, Shrinking Planet: The New Geopolitics of Energy**, entire and Smil, pp. 181-213
 - a. The political economy of oil, public policy and consumption (10/8-10/15)
 - b. Oil and U.S. Foreign policy (10/15-10/20)
11. Electricity (10/22-10/29)
 - a. Production and distribution (10/22) **Read:** Smil, pp. 31-44
 - b. Regulation and restructuring (10/27) Amy Abel, et. al., **Electric Utility Restructuring: Maintaining Bulk Power System Reliability**, Congressional Research Service, February 1, 2005, available at http://cip.gmu.edu/archive/450_ElecUtilityRestructuring.PowerSysReliability2.1.05.pdf

- c. Distributed generation (10/29) and Benjamin Sovacool and Richard Hirsh, “Energy Myth Six – The Barriers to New and Innovative Energy Technology are Primarily Technical: The Case of Distributed Generation (DG)” pp. 145- 170 in **Energy and American Society – Thirteen Myths (on reserve)**; in class video at <http://www.pbs.org/now/shows/503/index.html>
12. Coal (11/3) **Read:** Smil, pp. 229-238; Krupp and Horn, Chapter 8
13. Climate Change (11/5) **Read:** Eileen Claussen and Janet Peace, “Energy Myth Twelve - Climate Policy will Bankrupt the U.S. Economy” pp. 311-340 in **Energy and American Society – Thirteen Myths (on reserve)**
14. Nuclear power (11/10-11/17)
- a. How nuclear power works: nuclear technology and the fuel cycle (11/10) **Read:** World Nuclear Association, “Nuclear Power Reactors,” available at <http://www.world-nuclear.org/info/inf32.html> and Marshall Brain and Robert Lamb, “How Nuclear Power Works,” and Marshall Brain, “How Nuclear Radiation Works,” available at <http://www.howstuffworks.com/nuclear-power.htm/printable> <http://science.howstuffworks.com/nuclear1.htm>
 - b. Nuclear power policy (11/15-17) **Read:** Smil, pp. 309-316; R.L. Worsnop, “Will nuclear power get another chance?” **CQ Researcher**, February 22, 1991, Volume 1, 114-129, available at <http://library.cqpress.com/cqresearcher/cqresrre1991022200>. and Jennifer Weeks, “Nuclear Energy,” **CQ Researcher**, March 10, 2006 Volume 16, Issue 10, 217-240, available at <http://library.cqpress.com/cqresearcher/cqresrre2006031000>.
15. Alternative energy sources (11/19-12/3)
- a. Conservation and end use efficiency (11/19) **Read:** Smil, pp. 317-339 and Krupp and Horn, Chapter 9.
 - b. Solar and wind (11/24) **Read:** Smil, pp. 272-290 and Krupp and Horn, Chapters 2 and 3.
 - c. Biofuels (12/1) **Read:** Smil, pp. 259-271 and Krupp and Horn, Chapters 4 and 5
 - d. Hydrogen (12/3) **Read:** Smil, pp. 296-309

Classes end 12 /9