

Political Science 340
Energy Policy
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Office Hours: M, T, W, TH 10:30 to 11:30 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

It has long been recognized that the fundamental human issue concerning energy is how any society uses energy to do work, produce goods and meet the basic needs and demands of its members. The choices that societies make in this regard have profound implications for the patterns of human settlement, the structure of social life, the distribution of income, and the allocation of political power. More recently, people have also begun to recognize that these choices also have implications for the viability of the environment and the conditions of human health. Some individuals with long-term vision 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. At that time, significant short-term disruptions of energy supplies prompted serious 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. Two decades of market ideology, significant aggregate economic growth, the globalization of the economy, the development of new telecommunications and computing technologies and the end of the Cold War obscured that debate, however. A combination of environmental concerns, a significant war in the Middle East, the spread of global terrorism, escalating military activity around access to oil and most importantly rising energy prices have only recently thrust these issues back before a relatively complacent American population. Yet, these issues deserve serious attention. This is the most essential purpose of this course. Towards that end, the course objects are as follows:

- To introduce students to the concepts that structure debates about energy use and policy choice, including the development of an understanding of the sources and end-uses of energy both in the United States and globally
- To develop in the students 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 with the students the current position that energy holds on the contemporary 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

Howard Geller, **Energy Revolution: Policies for a Sustainable Future**, (Washington: Island Press, 2003)

Michael Klare, **Blood and Oil**, (New York: Henry Holt and Co., 2004)

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

Vaclav Smil, **Energy at the Crossroads**, (Cambridge, MA: The MIT Press, 2003)

Evaluations of Students Work

The final grade will be based on a 250 point system. Final grades will be assigned according to the following scoring:

GRADE	POINTS	GRADE	POINTS
A	235	C	188
A-	225	C-	175
B+	220	D+	170
B	208	D	158
B-	200	D-	150
C+	195	F	<150

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

Essay 1 – David Nye presents a particular understanding of the way that technologies shape social relations, structure and culture. What is that perspective and how do the choices of human beings fit into that perspective? **{2 to 3 typewritten pages} (25 points)**

DUE DATE: 1/24

Essay 2 - A major premise of the course is that energy is of great importance because of its connection to work both as a physical and economic activity. Discuss what you have learned from the classes and readings scheduled between 1/22 and 1/29 to demonstrate that you understand the nature and types of work associated with energy. Make sure you discuss the major principles that govern how energy is available and used to perform work. **{4 to 7 typewritten pages} (50 points)**

DUE DATE: 2/5

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: 2/14

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: 2/21

Essay 5 - What is the relationship between U.S. foreign policy and the U.S. consumption of oil? **{4 to 7 typewritten pages} (50 points)**
DUE DATE: 3/13

Essay 6 – Write a letter to your parents identifying what you think they should know about nuclear power and its role as a future energy source. **{2 to 4 typewritten pages} (25 Points)**
DUE DATE: 4/17

Essay 7 - On page 2 of Howard Geller's **Energy Revolution: Policies for a Sustainable Future**, he identifies three themes for his book:

1. Current energy sources and patterns of use are unsustainable
2. An “energy revolution” is possible and desirable
3. It is possible to overcome barriers to this revolution through enlightened public policies.

Imagine yourself to having been asked by a local community planning board that includes representatives from business, labor, environmental, education, faith based and government organizations to provide a written statement about the validity of Geller's position. I.E., the planning board has asked you to tell them whether or not Geller is convincing and where he might be challenged. What would you write? **{5 to 7 typewritten pages} (50 points)**
DUE DATE: Final Exam Date

Energy Journals (20 points) - DUE DATE

Students will submit a typewritten report on how they used energy during the course of a week during this semester. The week in question will be the week of March 29 through April 4. 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 a 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 or government action, lessons learned by the individual about energy use, or a discussion of a particular event or activity that yielded to the student a noteworthy insight about the issues raised by the course.

Instructor Evaluation (30 points)

Ten points towards the final grade will be determined by instructor evaluation. This evaluation will be primarily based on participation in class discussion but also includes attendance, completing assignments on time and other indications of effort and commitment to the course.

Course Outline and Reading Assignments:

I Introduction (1/15)

Read: Start reading Smil, pp. 1-120

II Energy and Society (1/17)

- A. Philosophy of Technology: Technological Determinism, Technological Momentum and the Social Construction of Technology

Read: Nye, “Introduction”

- B. Energy and the Economy: work, demand, end use, levels of consumption, presumptions about correlation between energy use and growth (1/22)

Read: Smil pp. 1-80

- C. Supply and the problem of exponential growth: what we have, where we get it, calculating the costs (1/24)

Read: Smil, pp. 81-120; A. Bartlett, “Forgotten Fundamentals of the Energy Crisis,” American Journal of Physics, September 1978, ON RESERVE or available on the internet at http://www.npg.org/specialreports/bartlett_index.htm

- D. Thermodynamics, entropy and end use; Energy Forecasting (1/29)

Read: “Heat Engines and Entropy,” pp. 79-98 in David Goodstein, Out of Gas, ON RESERVE; Smil, Chapter 3.

- E. Social consequences of energy use: energy use in the 19th Century (1/31)

Read: Nye, Chapters 1-4

- F. Energy and the social consequences of industrialization, urbanization, and suburbanization in the 20th Century (2/5)

Read: Nye, Chapters 5-6

- G. The energy crisis and responses to it. (2/7)

Read: Consuming Power, Chapt. 7-9

III The Policy Process

- A. Markets and Government: political economy, market failures and public goods (2/12)

Read: “The Market and the Polis,” pp. 17-34 in Deborah Stone, Policy Paradox, ON RESERVE; “The Meaning of Public Policy,” pp. 10-29 in Carter Wilson, Public Policy: Continuity & Change, ON RESERVE

B. The policy process: separation of powers, delegation of authority, federalism and interest group liberalism (2/14)

C. The policy process: Policy options and barriers (2/19)

Read: Geller, Chapters 1-3

IV Policy Issues

A. The political economy of oil, public policy and consumption (2/21)

Read: Smil, pp. 181-213; Klare, pp. 1-25

B. Oil and U.S. Foreign policy (2/26- 2/28)

Read: Klare, pp. 26-212

C. Electricity: production and distribution systems (3/11)

Read: Gellings and Yeager, “Transforming the Electric Infrastructure,” Physics Today, December 2004, pp. 45-51 ON RESERVE; Brennan, et.al., “Understanding the Electric Industry,” in Alternating Currents: Electricity Markets and Public Policy, ON RESERVE

D. Electricity: traditional regulation (3/13)

Read: Brennan, et.al., “From Regulation to Competition,” and “Competition in Energy, Regulation of Wires,” in Alternating Currents: Electricity Markets and Public Policy, ON RESERVE

E. Electricity: restructuring (3/18)

Read: Brennan, et.al., “Regulating Rates for Transmission and Distribution,” and “Encouraging Competition” in Alternating Currents: Electricity Markets and Public Policy, ON RESERVE

F. Coal (3/25)

Read: Smil, pp. 229-238

G. Natural gas (3/27)

Read: Smil, pp. 213-229

H. How nuclear power works: nuclear technology and the fuel cycle (4/1)

Read: web articles located at:

<http://www.howstuffworks.com/nuclear-power.htm/printable>

<http://science.howstuffworks.com/nuclear1.htm>

I. The history of nuclear power (4/3)

J. The future of nuclear power (4/8)

Read: Massachusetts Institute Technology (MIT). 2003. The Future of Nuclear Power, “Summary Report” available at:

<http://web.mit.edu/nuclearpower/pdf/nuclearpower-summary.pdf>

K. Alternative energy sources: conservation and end use efficiency (4/10)

Read: Amoryovins, Energy End-Use Efficiency, Rocky Mountain Institute, 2005 available at http://www.rmi.org/images/PDFs/Energy/E05-16_EnergyEndUseEff.pdf

L. Alternative energy sources (4/15-4/17)

Read: Smil, Chapter 5; Mary Cooper, Alternative Fuels: Is Hydrogen the Fuel of the Future, CQ Researcher, February 25, 2005 available at

<http://library.cqpress.com/cqresearcher/document.php?id=cqresrre2005022500>

M. Sustainable energy (4/22)

Read: Geller, Chapters 5 and 8