

Political Science 340
Energy Policy
Spring 2006

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Office Hours: M, T, W, 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

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. With the exception of environmental concerns, even a significant war in the Middle East, the spread of global terrorism and escalating military activity around access to oil have not yet thrust these issues back before a rather 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 discretion.

Texts

Howard Geller, **Energy Revolution: Policies for A Sustainable Future**, (Washington, D.C.: Island Press, 2003) ISBN: 1-55963-965-2

David Goodstein, **Out of Gas**, (New York: W.W. Norton, 2004) ISBN: 0-393-05857-3

David Nye, **Consuming Power**, (Cambridge, MA: MIT Press, 1998) ISBN: 0-262-64038-4

Matthew Yeomans, **Oil: A Concise Guide to the Most Important Product on Earth**, (New York: The New Press, 2004) ISBN: 1-59558-028-X

Evaluations of Students 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+	265	D+	205
B	255	D	195
B-	240	D-	180
C+	235	F	<180

The scores will be determined through set of take home essays, 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

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 - How do technologies shape social relations, structure and culture? **(10 points)**

DUE: 1/18

Essay 2 - How do the laws of thermodynamics and the principles of exponential growth affect the ability of a society to use energy to do work? **(25 points)**

DUE: 1/27

Essay 3 - What do you think are the most significant social, economic and cultural developments associated with the increased consumption of oil and electricity? **(50 points)**

DUE: 2/22

Essay 4 – What is the relationship between U.S. foreign policy and the U.S. consumption of oil? **(50 points)**

DUE: 3/17

Essay 5 – What are the problems and prospects that the expanded use of electricity in the U.S. will entail? **(40 points)**

DUE: 4/14

Essay 6 – Write a letter to congressperson outlining principal policy goals – what America should seek to do and why. **(100 points)**

DUE: Final exam date

Energy Journals (15 points)

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. **Journals will be due April 7**

Instructor Evaluation (10 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 (1/11)

II Energy and Society

A. Philosophy of Technology: Technological Determinism, Technological Momentum and the Social Construction of Technology (1/13)

Read: Consuming Power, Introduction

B. Energy as Work, Demand, Economic Growth, Problems (1/18)

Read: The Hydrogen Economy, Chapt. 1 and 3 and pp. 156-168

C. Thermodynamics, entropy and end use (1/20)

Read: Out of Gas, pp. 13-98

D. Exponential Growth and the Hubbert Curve (1/25)

Read: A. Bartlett, “Forgotten Fundamentals of the Energy Crisis,” American Journal of Physics, September 1978, ON RESERVE

II Decision Making and Public Policy

A. Making Energy Choices – Markets and Government (1/27)

Read: Walter Rosenbaum, “The Politics of Environmental Policy,” ON RESERVE

B. The public policy process: how are decisions made and by whom (2/1)

C. Nature of technology policy - policy options and problems (2/3)

III The Social Consequences of Energy Use

A. The historical development and social consequences of U.S. energy choices: the 19th Century (2/8)

Read: Consuming Power, Chapt. 1-4

B. Industrialization, urbanization, and suburbanization (2/10)

Read: Consuming Power, Chapt. 5-6

C. The Energy Crisis and responses to it. (2/15)

Read: Consuming Power, Chapt. 7-9

D. Energy choices: Hard vs. Soft Path (2/17)

Read: Amory Lovins, “Energy Strategies: the Road Not Taken,” Foreign Affairs, ON RESERVE

IV Policy Issues

A. Oil

1. The political economy of oil (2/22 and 2/24)

Read: The Hydrogen Economy, Chapt. 2 and 4

2. Public policy and consumption (3/1)
3. Oil and U.S. foreign policy (3/3 and 3/15)

Read: Resource Wars, entire; The Hydrogen Economy, Chapt. 5 and pp. 145-154

B. Other Fossil Fuels: Natural Gas, Coal and Unconventional Oil

1. Supply (3/17)

Read: The Hydrogen Economy, Chapt. 6

Also read the material located at the following web addresses:

Coal:

- <http://www.eia.doe.gov/cneaf/coal/page/special/feature.html>
- <http://www.ucsusa.org/CoalvsWind/c02c.html>
- <http://www.healthandenergy.com/coal.htm>
- http://balancedenergy.org/cct_brochure/page01.asp

Natural Gas:

- <http://www.naturalgas.org/overview/overview.asp>
- http://www.healthandenergy.com/natural_gas_shortages.htm

2. Environmental issues (3/22)

C. Electricity

1. Production and distribution (3/24)

**Read: Timothy Brennan, et. al., “Understanding the Electricity Industry,”
ON RESERVE**

2. Regulation and restructuring (3/29)

**Read: Brennan, et. al., “From Regulation to Competition,” and “Competition
in Energy, Regulation and Wires,” ON RESERVE**

3. Environmental and security issues (3/31)

Read: The Hydrogen Economy, pp. 168-175

D. Nuclear Power

1. Technology and the fuel cycle (4/5)
2. History (4/7)
3. Economic and safety issues (4/12)

E. Alternatives (4/14, 4/19 and 4/21)

1. Hydrogen

Read: Out of Gas, pp. 99-123; The Hydrogen Economy, Chapt. 8 and 9

2. Conservation and efficiency
3. Soft path renewables

F. Evaluation (4/26)

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