HTS 4081-A: SEMINAR IN HISTORY OF TECHNOLOGY

"HISTORY OF ENERGY"

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D.M. Smith 203
Wednesday, 3-6

SEMINAR DESCRIPTION:

This seminar will investigate selected topics within the relatively new field of energy history. Although we will spend some of our time looking at energy use patterns in antiquity and pre-industrial times, the heart of the course will focus on humankind's use of energy in the industrial era since the 18th century. We will address scholarly efforts to periodize the past by energy use pattern (e.g. "age of coal," "age of petroleum"), and consider the concept of energy transition as a factor in understanding human history. In the process of our inquiry we will study the evolution of specific energy technologies in the modern epoch, the somewhat eccentric histories of alternative energy technologies, and the growth of public policy in the energy field. With this historical analysis as our starting point, we will spend some time discussing energy usage, options, and policies in the present, and think a bit about energy choices for the future. For example, fossil fuels will become depleted at some point; on that there is no disagreement. Should we pursue a "hard path" to our energy future (high tech, nuclear power, highly centralized and expensive systems) or a "soft path" (solar power, biomass conversion, more decentralized and human-scale systems)?

REQUIREMENTS:

Grades will be determined by a midterm exam (25%), a final exam (25%), a research paper (25%), and oral contributions to the seminar discussion (25%). This latter grade will be comprised of 1) the instructor's evaluation of individual seminar performance (preparation and participation); and 2) the grade for the oral presentation of individual research on either April 13, 20 or 27(discussed further below). It is therefore absolutely essential that you attend the seminar, as we will meet only fifteen times during the entire semester. A missed class is an entire week's work and is unacceptable. There are no excused absences except for unusual circumstance (family emergency and the like).

You may choose any topic in the field of energy history for your research paper that is approved by the instructor. All proposed topics must be submitted by **February 2**. The length of the research paper should be 30 typed, double spaced pages with a **minimum** of ten sources. The paper must have a bibliography of all sources used and employ appropriate footnote or endnote documentation (either footnotes or endnotes are acceptable). Footnote/endnote style must conform with the standard employed by the scholarly historical community (superscript numbers consecutively throughout the paper with required documentation in the appropriate note). A guide to this style may be found in Kate L. Turabian, *A Manual for Writers of Term Papers, Theses, and Dissertations* (paperback, University of Chicago Press) or the much fuller

University of Chicago Manual of Style (any recent edition). A source might be a book, pamphlet, journal article, magazine article, newspaper, oral interview, documentary collection, or other printed source. Although primary documents are not an absolute requirement, such material would be a strong asset to your paper. Many of you may be able to gain access to archival materials, particularly since the internet has made such collections more readily available. If you use any internet source for your research, you must include the home page of the site as an appendix to your bibliography. Be wary of internet research and use judgement when accessing many internet sites. It is a good policy to use material from reputable institutions such as universities, libraries, or historical societies and organizations. There are many internet sites whose "information" is suspect. One last note on the internet. Work submitted in this class must be your own. Purchase of a canned or commissioned term paper on the internet is risky business indeed. As indicated in the information on the Georgia Tech Honor Code below, evidence of such plagiarism will result in the most severe penalty. Plagiarism of any form is one of the most heinous of crimes as you are stealing the work and ideas of someone else and passing them off as your own.

The final paper is due on or before **Wednesday April 27**, but an outline and preliminary bibliography must be submitted by **March 16**. All papers must be submitted in hard copy; electronic submission is not acceptable. In addition, each student is responsible for preparing a short, fifteen minute oral presentation of his or her research to be given on either April 13, 20 or 27. For that presentation each student must also prepare a one page outline of the research project and a short bibliography, a copy of both to be distributed to each seminar member the day of his or her presentation.

GEORGIA TECH HONOR CODE:

Students in this seminar will be expected to abide by the honor code and avoid any instances of academic misconduct including but not limited to: 1) possessing, using, or exchanging improperly acquired written or oral information in the preparation of an exam or paper; 2) substitution of material that is wholly or substantially identical to that created or published by another individual or individuals; 3) false claims of performance or work that has been submitted by the student. See published Honor Code for additional information (the full text of the code, the history of its development and implementation, and other related information may be found on the web at **http://www.honor.gatech.edu/**.

REQUIRED TEXTS:

Ken Butti and John Perlin, *2500 Years of Solar Architecture and Technology* (Cheshire Books, 1980), Paperback

Barbara Freese, *Coal: A Human History* (Penguin Books, 2004), Paperback

David E. Nye, *Consuming Power: A Social History of American Energies* (MIT Press, 1999), Paperback

Vaclav Smil, *Energy at the Crossroads: Global Perspectives and Uncertainties* (MIT Press, 2003), Hardback

Daniel Yergin, *The Prize: The Epic Quest for Oil, Money & Power* (Simon & Schuster, 1993), Paperback

Additional readings listed on the syllabus are available in the HTS reading room (D.M. Smith room 219). In the late 1970s and the 1980s there was a great deal of interest in energy studies in the wake of the 1973 and 1979 oil price hikes, but it declined as world petroleum reserves expanded and prices retreated. This also meant that a lot of books written then (including mine) have been long out of print. There are three copies of each of three readings in a box file with my name on it in the reading room. These article- length pieces may be read at your leisure, but they are not to be taken from room 219. The list of articles and full citation references are as follows:

Reading #1: August W. Giebelhaus, "Farming for Fuel: The Alcohol Motor Fuel Movement of the 1930s," *Agricultural History*, Vol. 54 No. 1 (January 1980), pp. 173-184

Reading #2: Arnold Krammer, "An Attempt at Transition: The Bureau of Mines Synthetic Fuel Project at Louisiana, Missouri," Lewis J. Perelman, August W. Giebelhaus, and Michael D. Yokell (eds.), *Energy Transitions: Long-Term Perspectives* (Westview Press for the American Association for the Advancement of Science, 1981), pp. 65-107.

Reading #3: August W. Giebelhaus, "Sustainable Energy for the Twentieth Century: Solar and Nuclear Power," Frank J. Coppa and Richard Hammond (eds.), *Technology in the Twentieth Century* (Kendall/Hunt, 1983), pp. 167-193

CLASS CALENDAR AND SCHEDULE OF ASSIGNMENTS:

January 12: Course introduction; general discussion of the history of energy; energy in historical perspective

January 19: Early power sources, harvesting the energy of the sun; past "energy crises" and the concept of energy transition. **Reading:** Butti and Perlin, foreward and pp. 1-59; Smil, pp. 1-62.

January 26: The fossil fuel transition; the coming of coal, steam, and the industrial revolution**.** **Reading:** Freese, pp. 1-128.

February 2: The social and economic history of coal; coal in the past, present, and future. **Reading:** Freese, pp. 129-248. **Research paper topics must be submitted by this date.**

February 9: The modern transition to petroleum; birth of a new industry; Standard Oil and its competitors; monopoly to oligopoly. **Reading:** Yergin, pp. 1-338.

February 16: The hydrocarbon age; geopolitics of world oil; the emerging Middle East; energy crises of the 1970s. **Reading:** Yergin, pp. 339-788.

February 23: MIDTERM EXAM

March 2: America: the pre-industrial era**;** water and wind power; agricultural needs; transition to fossil fuels. **Reading:** Nye, pp. 1-130.

March 9: Changing U.S. consumption patterns; the importance of electrical power; the political

economy of energy. **Reading:** Nye, pp. 131-264.

March 16: Energy in the world economy; energy and the environment; energy forecasting; future of fossil fuels. **Reading:** Smil, pp. 63-238. **Outline and preliminary bibliography of research paper are due.**

March 21-25: Spring Break

March 30: Alternative energy technologies; continuing history of solar power (active and passive systems); gasohol, shale oil, and synfuels; wind and hydroelectric; nuclear energy in war and peace. **Reading:** Butti and Perlin, pp. 60-253**;** Smil, pp. 239 -316; Readings # 1 (Giebelhaus), 2 (Krammer), 3 (Giebelhaus).

April 6: Our energy future; alternative energy scenarios**;** efficiency and beyond. **Reading:** Smil, pp. 317-373.

April 13: Oral presentations and discussion of research papers. **Assignment:** work on research papers

April 20: Oral presentations and discussion of research papers. **Assignment:** work on research papers.

April 27: Oral presentations and discussion of research papers. **Research papers due.**

May 2-6: Final Examination Period: Our final exam is presently scheduled for Exam Period 5: Tuesday May 3, 11:30-2:20. Although this schedule is rarely changed, I would not book travel plans until the official final examination schedule is published later in the semester.