

# Energy Policy and Economics

CIT 39612/EPP 19666

A 6-hour, ½ Semester Course, Spring 2016  
T/Th, 9:30 to 11:20, WEH 5302

Instructor: Jay Whitacre  
whitacre@andrew.cmu.edu  
4323 Wean Hall  
With: Rebecca Ciez  
rciez@andrew.cmu.edu

## **COURSE DESCRIPTION:**

In this course, a survey of the relevant recent Energy Policy literature will be undertaken. An emphasis will be placed on studying the interactions between technology, performance, cost, and government decision-making, with an eye towards placing specific renewable technologies in the context of policy decisions. Much of this class will be discussion driven, and significant reading will be required. Each class will consist of 30 to 60 minutes of instructor led exposition or lecture, followed by student led discussions on assigned readings. *Note/disclaimer:* this course is *not* intended for Ph.D.- level EPP students. The content is most appropriate for students in the Energy Masters program, other CIT students, and undergraduate EPP students. If you are a Ph.D. EPP student, you will likely find this content overlaps significantly with content you have or will see elsewhere and you are hereby warned that you might be bored.

## **READING AND WRITING ASSIGNMENTS**

The assignments for each class can be found in the “assignments” folder in the blackboard system. Each Thursday, a 1-page assignment will be issued that contains the reading and writing assignments for the following week’s classes. There will be 2 to 4 readings assigned per class (depending on length and depth), and a student will be assigned as a discussant for

each paper. Students may volunteer multiple times during the semester, but everyone is required to volunteer at least once during the semester, and priority will be given to students who have not yet had the opportunity to lead a discussion. Every Tuesday, the previous week's writing assignment is due, and should be submitted digitally via blackboard. This is a paper-free class: professor feedback for your assignments will be provided via email, and all grades will be maintained in Blackboard.

**TENTATIVE WEEKLY SCHEDULE:**

<b>LEC #/ DATE</b>	<b>TOPIC</b>	<b>ASSIGNMENT OUT/IN</b>	<b>EDUCATIONAL GOAL</b>
1 3/15	Overview: the state of energy and the symbiosis between energy, policy, technology, and the economy	<b>Out:</b> Assignment 1	Take home: deep importance of energy technology and why policy is vital and who does it. Develop a sense of how policy and technology and economics influence the movement of energy and fuels.
2 3/17	Externalities: environmental, political, cultural		The consequences of using Energy; economic, environmental, societal
3 3/22	Supply and Demand of Energy – the economics and characteristics of Fuels (coal and others, infrastructure)	<b>In:</b> Assignment 1	Units and sources of energy, degree of transport needed, economic drivers, and the role of uncertainty and risk in energy futures.
4 3/24	World Oil and Gas Markets and energy security		Defining energy security (history)– what is a world market, what is security, and what is the real cost oil
5 3/29	Electricity Markets	<b>In:</b> Assignment 2	North American electricity markets and structures, evolution of deregulation

6 3/31	Electricity production: technologies and costs		Technology description and map over to different use cases, environments, emissions and costs.
7 4/5	Energy for transportation	<b>In:</b> Assignment 3	What are options, what are trades, debunk key points. Pros/cons of electrified transportation.
8 4/7	Economics/Policy of Renewables I – technical and policy challenges of incorporating renewables		Hydro, Wind, Solar, RPS, Policy drivers, etc
9 4/12	Economics/Policy of Renewables II – impact of renewables policy on climate change	<b>In:</b> Assignment 4	Climate policy options, recent actions to control U.S. electricity emissions
4/14	<i>No class, Spring Carnival</i>		
10 4/19	The policy of energy efficiency	<b>In:</b> Assignment 5 <b>Out:</b> Final Exam Assignment	What are the range of tools that allow energy efficient technologies to impact consumption. Barriers, solutions, policy, and economics.
11 4/21	International Emissions and Environmental Negotiations		Holistic overview of emissions with some deep case studies. The politics of climate change, and is it already too late?
12 4/26	Innovation in energy technology	<b>In:</b> Assignment 6	The nature of energy technology innovation and why the U.S. is challenged in this area.
13 4/28	The reality of policymaking and the future of energy policy		Population growth, dealing with climate change, water and shortages What will you do?
5/9	<i>Final Exam due</i>		

**Class format:**

- 1) Attendance
- 2) Announcements
- 3) Questions from last class, general feedback on assignments
- 4) 30-45 minute lecture (if necessary – could also be a guest lecture)
- 5) Student-led discussion on assigned papers. 3 to 4 papers per class
  - a. Have a list of questions generated by both student discussion leader and professor. Use a random list of students when there is no volunteering

**Assignments:**

One written assignment per week.

- Double Spaced, greater than 4 pages, less than 5
- Position piece on relevant topic.
- Questions include things like: X is good for Y but bad for A – Should X be done? Justify your answer.

**Final exam:**

This will be a 10 - 15 page paper “Op-Ed” style piece. This will be culmination of the content covered in class and needs to probe deeply into several areas that have been covered. A detailed description of this assignment will be handed out on 4/21, and the exam will be due on the day of the classes scheduled final, which is Monday May 9<sup>th</sup>.

**Final grade**

Your final grade will be determined using grades from assignments (graded on 1-10 scale), the final (graded on a 100 point scale) and a participation grade (graded on a 1 -10 scale). The final grade will be calculated in a % and will then be translated into letter grades. A weighted average will be applied as follows:

- Assignments: 55% of final grade
- Final writing assignment: 25% of final grade,
- Participation: 20% (including discussion, attendance)

**READING/ESSAY ASSIGNMENTS:** Based on each reading/topic, a written assignment will be issued. Students will be asked to write synthetic essays and/or complete analyses pertaining to the reading materials. These will be short (>2, <4 pages single space) pieces. There will be 6 of these assignments through the course of the class, one due each week, except for the last week.

Each week the reading assignment for the following week will be posted on Blackboard along with the essay assignment in a separate document. Each work assigned for reading will have 1 or 2 presenters assigned to it from the class. Part of the participation grade is an evaluation of the presentation made in class. The specifics of this will vary depending on the papers, and this will not start until the second class. In general you will be asked to describe the main points of the paper and to offer a critique of the contents. In some cases, papers with opposing views will be presented and a debate will be posed.

#### **COURSE PROCEDURES AND PROTOCOLS:**

- Class begins promptly at 9:30 AM.
- Assignments are due by noon via Blackboard's assignment page on the designated date. **Assignments should not be submitted via email.** To submit an assignment, select assignments in the tool bar, then select view/complete assignment under the heading of the assignment you wish to complete. Attach the file under heading number 2 "Assignment Materials". Finally, select submit to successfully submit your assignment. Homework submitted late will incur a penalty of 10% of total points per day late. All files submitted should use the following file naming convention: Lastname\_Date\_AssignmentTitle (e.g., fisher\_20100920\_EconHW). Within each file, please include your name and date at the top of each page.
- Collaboration is working together to come to frame a problem and work through a solution, discussing results, and analyzing the process. All members of the group contribute, understand the process (sometimes by being taught by other members of the group), and are prepared to complete a similar problem by themselves afterward. Collaboration is encouraged on homework assignments. However, for individual assignments, individual submissions are required. While you may have worked with another in solving the problem the work you hand in must be your own.
- Academic integrity is a core value at Carnegie Mellon. Cheating, including copying someone else's work and handing it in as your own work is unacceptable. It is equally unacceptable to allow others to use your work.
- Plagiarism is using someone else's published work and not giving them credit. Several web sources or the library have guidelines for referencing work from published journals, books, or newspapers, and from websites. (See "Citations and

References” section, below.)

- Cheating and plagiarism will be handled according to university policies, which include the penalty for the assignment (usually a zero grade), and reporting the incident to Student Affairs.
- Regrades are possible within a one week timeframe after the assignments are returned in class. After that time, no regrades will be considered (except for simple addition errors). To submit a regrade, you should attach a sheet of paper detailing your concerns about the score given and argue your point. Regrade requests should be handed to the professor in class.

### **HOW TO PROPERLY CITE MATERIAL IN YOUR WRITING:**

In order to put together a professional report and to avoid plagiarism, it is imperative to become familiar with the proper procedures and styles for citing sources. There are several different styles and many online guides on proper citing. For this class, the specific style used (APA, MLA, etc.) is up to you, so as long as it is consistent and properly done. Below are some resources that outline citation styles.

1) Duke University reference for citations:

[http://www.lib.duke.edu/libguide/cite/works\\_cited.htm](http://www.lib.duke.edu/libguide/cite/works_cited.htm)

A good online reference, where you can easily find how to cite several different types of works.

2) CMU Reference for citations:

<https://libwebspace.library.cmu.edu:4430/Genref/citing.html>

3) University of California Berkeley reference for citations and definitions of plagiarism:

<http://www.lib.berkeley.edu/TeachingLib/Guides/Internet/Style.html>

This has good pdf's of different styles.

**FINAL NOTE – A NOD TO WHERE SOME OF THESE IDEAS CAME FROM:**

The syllabus used here (and associated reading list) draws in part from syllabi developed by other professors.

These include:

- 1) “The Political Economy of Energy Policy”, taught by Professor David G. Victor, Stanford University
- 2) “Policy Approaches to Mitigating Climate Change,” Taught by James Sallee, University of Chicago
- 3) “Energy Policy and Environment”, Taught by Russ Houldin, University of Toronto.
- 4) “Energy Policy: Technologies, Systems, and Markets”, taught by John Holdren and Henry Lee, Harvard University
- 5) “Energy Policy”, Taught by Gary Flomenhoft, University of Vermont Law School
- 6) “International Sustainable Energy Policy” taught by Nitin Pandit, George Mason University (Adjunct).
- 7) “Energy and Innovation” Taught by Costa Samaras, Carnegie Mellon University