

Energy Economics and Policy

ARE 495 002

North Carolina State University

Fall 2017

Instructor: Harrison Fell

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Office hours: M/W 1:15 – 2:45 & Tues. 2:00 – 3:00

Class meeting days/times: M/W 3:00 – 4:15

Website: <https://moodle-courses1718.wolfware.ncsu.edu/course/view.php?id=1549>

Textbook and/or other requirement materials:

Required text: None, readings will be assigned throughout the class

Student learning outcomes: At the conclusion of the class students will...

1. Students will get an introduction to energy markets.
2. Students will understand the nature of market failures and potential policy responses.
3. Students will gain familiarity with issues surrounding the debates on several current energy and environmental policy issues.

Academic Integrity: Cheating will be prosecuted to the maximum extent possible within the University's Code of Student Conduct: <http://policies.ncsu.edu/policy/pol-11-35-01>

Brief list of topics covered:

1. Introduction to oil markets.
2. Introduction to natural gas markets.
3. Introduction to electricity markets.
4. Renewable energy markets and policy.
5. Energy efficiency policy and outcomes.
6. Environmental policy and interactions with energy markets.
7. Market structure and its impacts on market outcomes.

Grading Procedures: *(Note: all courses must have a published, transparent grading policy that students can use to gauge their performance and progress in the class through the course of the semester.)*

Coursework Return Policy:

The weighting of the final grade will be determined as follows:

Exam 1 –	20%
Exam 2 –	20%
Final –	20%

OPEC Strategy Game -	10%
Electricity Strategy Game -	10%
Homework -	10%
Participation -	10%

Exams 1 and 2 will be closed-note, closed-book, in-class exams tentatively scheduled for the 5th and 10th weeks of class. The final will be comprehensive and be given at the normally scheduled time for this course. There will be 3 to 4 short homeworks given throughout the semester as well. These are intended to be done as individual assignments, though students may work together on these assignments. The homeworks will be due at the beginning of class on the assigned due dates. Homework turned in late will not be accepted without prior approval. Participation grades will be assigned based on student attendance and student participation in the general discussions. Finally, there will be two different group projects – the OPEC Game and the Electricity Strategy Game. Information about these games are given below.

OPEC Game: The OPEC game is a series of simulations of the world oil market. In the first stage of the game there are 7 independent producers, each of which has to make an independent strategic output decision. In the second stage, the 7 independent producers are allowed to meet and attempt to form a cartel. Grading will be based on performance in the game, the strategy memo, and quality of participation in the OPEC cartel meeting in class. The schedule for the OPEC game is on the last page of the syllabus. Depending on enrollment, teams will be 3 to 4 students per team. Assignment to teams will occur as we approach the beginning of the game.

Electricity Strategy Game: The Electricity Strategy Game (ESG) is an electricity market simulation in which each utility owns a portfolio of generation unit and bids those units into an electricity market. The game starts with a relatively simply bidding structure. Later rounds add the complexity of a tradable emissions permit market. Grading will be based on the performance in the game, the strategy memo, and the quality of participation in the ESG debriefing in class. The schedule for the ESG is on the last page of the syllabus. If teams are assigned, they will not be the same as in the OPEC game.

Absence Policy (e.g., Sports/Activities Policy): Attendance and participation are mandatory. Please notify the instructor of any planned absences.

Homework:

- Homework assignments will be given and are due at the beginning of class on the given due date.
- Exams: If you will be absent during a scheduled exam, you should schedule a make-up time before you leave.

Detailed Course Schedule:

Below is a tentative outline for the class with an expected reading list. I stress that this is a tentative list. Topics, readings, and listed order are all subject to change based on class progress and professor preferences. Please consult the webpage for this class frequently for updates on topics covered and required readings.

Part 1. Microeconomic Refresh and Market Power Issues

8/16 – 8/23

- Economic efficiency
- Monopolistic outcomes
- Oligopsony outcomes

Part 2. Oil and Gas Markets

8/23 – 9/13

- Introduction to Oil and Natural Gas Markets
- Pricing and Extracting Exhaustible Resources
- Introduction to OPEC Strategy Game
- The Economic Role of Energy Transportation
- The Economics of Energy Storage
- OPEC cartel meeting
- Commodities and Futures Markets
- Related transportation policies

(Tentative) September 18th, Midterm Exam # 1

PART 3: Electricity Markets

9/20 – 10/11

- Introduction to electricity sector in U.S.
- Electricity Restructuring
- Nuclear power
- Renewable power
- Energy efficiency
- Introduction to the Electricity Strategy Game

(Tentative) October 23th, Midterm Exam #2

PART 4: ENVIRONMENTAL POLICIES FOR ENERGY MARKETS & MISC. TOPICS

10/25 – 11/27

- Auction Design
- Environmental Externalities in Energy Markets
- Emissions Trading
- Climate Change Policy
- Policies for Renewable Fuel
- Energy Issues in NC
- Energy Markets in the Developing World

Final Exam as Scheduled During Exam Week

OPEC GAME SCHEDULE:

Round A (practice)	Monday, September 4
Round 1	Wednesday, September 6
Round 2	Monday, September 11
Round 3	Wednesday, September 13
Cartel Meeting Presentations	Wednesday, September 20
Round 4	Wednesday, September 20
Round 5	Monday, September 25
Round 6	Wednesday, September 27
Final Strategy Memo	Monday, October 2

ELECTRICITY STRATEGY GAME SCHEDULE:

Round 1	Monday, October 9
Round 2	Wednesday, October 11
Round 3	Monday, October 16
Emission Permit Bids	Wednesday, October 18
Round 4	Wednesday, October 25
Round 5	Monday, October 30
Round 6	Wednesday, November 1
Final Strategy Memo	Monday, November 6