Economics 251  
Natural Resource and Energy Economics

Course Description: This course examines issues in the provision and management of renewable natural resources (e.g., fish stocks and forests), non-renewable natural resources (e.g., oil, natural gas, and coal), and energy products and services (e.g., electricity and gasoline). It offers both theory and empirical methods related to: (1) market structure, pricing, and performance of important energy and resource industries; (2) sources of market failure in these industries; and (3) alternative regulatory approaches. Students are encouraged to take this course as part of a two-course sequence that includes Economics 250. Prerequisites: Economics 202, 203, 204, and a course in econometrics; or equivalent with consent of the instructor.

Contact Information:

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Office Hours By appointment By appointment

Class meeting: MW 3:15-5:00 (Class room: TBA)

Readings: Course readings are listed below. There is no textbook.

Prerequisite: Economics 202, 203, 204, and a course in econometrics; or equivalent with consent of the instructor.

Course Format:

Some key goals of the course are to acquaint students with key issues in environmental and energy economics, to convey important theoretical and empirical findings, and to provide tools for continued research in these areas. Toward these ends, classes will involve lectures by the instructors, student presentations of specified readings, and class discussion.

More specifically, most of the class meetings will focus on a pre-assigned paper. We will ask students to 1) read the assigned papers in advance, 2) prepare and turn in at the beginning of class a “referee report” on the paper that is assigned for a report, 3) give a presentation of a paper that is assigned for a referee report (once or twice for each student in the quarter), 4) hand in two problem sets, 5) hand in an one-page research proposal, and 6) hand in a three-page final proposal in the end of the course.

This approach facilitates close reading and analysis of key papers and a good grasp of the important theoretical and empirical issues.
Grading:
Referee reports and presentation, and class discussion: 50%
Problem sets: 20%
One-page research proposal: 10%
Three-page final research proposal and final presentation (10 min): 20%

Course Schedule:

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Instructor</th>
<th>Assignment due</th>
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<tbody>
<tr>
<td>1/7</td>
<td>Introduction to Energy Markets: Market Power, Regulation and Deregulation</td>
<td>Ito</td>
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<tr>
<td>1/9</td>
<td>Electricity Markets: Supply</td>
<td>Ito</td>
<td>Referee report</td>
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<tr>
<td>1/14</td>
<td>Experimental and quasi-experimental research design</td>
<td>Ito</td>
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<tr>
<td>1/16</td>
<td>Electricity Markets: Demand</td>
<td>Ito</td>
<td>Referee report</td>
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<tr>
<td>1/21</td>
<td>No class -Holiday</td>
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<tr>
<td>1/23</td>
<td>Oil and Gasoline Markets</td>
<td>Ito</td>
<td>Referee report</td>
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<tr>
<td>1/28</td>
<td>Fuel Economy Standards and Automobile markets</td>
<td>Ito</td>
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<tr>
<td>1/30</td>
<td>Energy Efficiency</td>
<td>Ito</td>
<td>One-page research proposal</td>
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<tr>
<td>2/4</td>
<td>R&amp;D and Innovation in Energy Markets</td>
<td>Ito</td>
<td>Referee report</td>
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<tr>
<td>2/6</td>
<td>Economics of Renewable Energy</td>
<td>Ito</td>
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<tr>
<td>2/11</td>
<td>Resource Extraction</td>
<td>Reguant</td>
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<tr>
<td>2/13</td>
<td>Auctions in Energy Markets</td>
<td>Reguant</td>
<td>Referee report</td>
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<tr>
<td>2/18</td>
<td>No class -Holiday</td>
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<tr>
<td>2/20</td>
<td>Market-based environmental regulation</td>
<td>Reguant</td>
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<tr>
<td>2/25</td>
<td>Environmental regulation in second-best settings</td>
<td>Reguant</td>
<td>Referee report</td>
</tr>
<tr>
<td>2/27</td>
<td>Renewables regulation in electricity markets</td>
<td>Reguant</td>
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<tr>
<td>3/4</td>
<td>Electricity markets and permit markets</td>
<td>Reguant</td>
<td>Referee report</td>
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<tr>
<td>3/6</td>
<td>Impacts of environmental regulation I</td>
<td>Reguant</td>
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<tr>
<td>3/11</td>
<td>Impacts of environmental regulation II (dynamics)</td>
<td>Reguant</td>
<td>Problem set</td>
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<tr>
<td>3/13</td>
<td>Final thoughts and remarks</td>
<td>Reguant</td>
<td>Three-page final research proposal and final presentation in class</td>
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<td>Energy, development and the environment</td>
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Note re Special Accommodation:

Students who have a physical, psychological, or learning disability that may necessitate an academic accommodation or the use of auxiliary aids and services in a class must initiate the request with the Disability Resource Center (DRC), not with the instructor. The DRC will evaluate the request along with the required documentation, recommend appropriate accommodations, and prepare a verification letter dated in the current academic term in which the request is being made. Students should contact the DRC as soon as possible as timely notice is needed to arrange for appropriate accommodations. The DRC is located at 563 Salvatierra Walk.

Referee report:

See “Guideline for referee report” in the course website.

Problem set:

This year, we decided not to have the final exam. Instead, we ask students to hand in two problem sets. Each problem set includes questions about required readings and we hope that the problem sets are useful to understand the class materials.

Student Presentation Schedule:

When we have a student presentation, a student is asked to present an assigned paper for 15-20 minutes and have class discussion for 10-15 minutes. Please send your presentation slides to the instructor by the morning on the day you present.

<table>
<thead>
<tr>
<th>Date</th>
<th>Paper for referee report and student presentation</th>
<th>Instructor</th>
<th>Student Presentation</th>
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<tbody>
<tr>
<td>1/23</td>
<td>(** Referee report due January 23**. Anderson,</td>
<td>Ito</td>
<td>Atul Gupta</td>
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<tr>
<td>Date</td>
<td>Reading</td>
<td>Authors</td>
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<td></td>
<td>Unilateral Market Power? Evidence from a Bid-Based Wholesale Electricity Market,” EUI Working</td>
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<td></td>
<td>Papers, 2009/36.</td>
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**TOPICS AND READINGS**

*Note 1:* The asterisk (*) identifies required readings, and the double-asterisk (**) identifies readings for referee reports and student presentations.

*Note 2:* The reading list might suffer minor changes during the quarter.

**ENERGY ECONOMICS**

1. **Introduction to Energy Markets: Market Power, Regulation and Deregulation**


Restructuring Disaster,” *Journal of Economic Perspectives*, 16(Winter).


2. Electricity Markets: Supply


3. Experimental and quasi-experimental research design


4. Electricity Markets: Demand


5. Oil and Gasoline Markets


Hughes, Jonathan E., Christopher R. Knittel, and Daniel Sperling, “Evidence of a Shift in the


6. **Fuel Economy Standards and Automobile Markets**


(*) Knittel, Christopher R., "Reducing Petroleum Consumption from Transportation," forthcoming *Journal of Economic Perspectives*.


7. Energy Efficiency


8. R&D and Innovation in Energy Markets


9. Economics of Renewable Energy


http://205.254.135.24/oiaf/aeo/electricity_generation.html


10. Resource Extraction


Economic Review 64, pp. 1-14.

11. Auctions in Energy Markets


ENERGY AND ENVIRONMENTAL TOPICS

12. Environmental Regulation: Quantities vs Standards


13. Environmental Regulation in Second-best Settings


14. Renewables Regulation in Electricity Markets


15. Interaction between Electricity Markets and Permit Markets


Fabra, N. and M. Reguant, “Pass-through of Emissions Costs in Electricity Markets,” mimeo.


16. The Welfare Impacts of Environmental Regulation (I)


17. The Welfare Impacts of Environmental Regulation – Dynamics (II)


18. Resources, Development and the Environment


