Economics of Energy and Environment

General Information

Course number: M3459.009
Instructor: Semee Yoon
Lecture Days/ Time: Wednesday 10am-12:50 pm
Lecture Location: zoom
E-mail: semee@snu.ac.kr
Office Hours: by appointment

Suggested pre-requisite: Microeconomics, Mathematics for Economics

Course Description

This graduate course provides a rigorous introduction to the economics of energy, with an emphasis on the implications for environmental policy. Energy markets have some unique aspects and institutional details, which are critical for designing effective policy. For energy, oil and gas markets, we will review theoretical justifications for government intervention. Then, we will explore what recent economic scholarship has to offer on energy policy questions current topics, e.g. best ways to promote renewable energy, benefits vs costs on new pipelines, and energy efficiency.

Students will be asked to think about and generate policy-relevant questions that can be answered empirically using data. We will review key empirical strategies and econometric concepts, read and discuss empirical academic articles, as well as write an empirical term paper.

Evaluation and Grading

The course grade will be based on:

Attendance and class participation	20%
Problem sets	20%
Journal article referee report (choose 1-3)	10%
Reading presentation	10%
Final paper	40%

Details about the presentation, problem sets, and the final paper will be given in class.

Books for the Course

This course will be taught principally through the medium of scholarly articles and papers. All the readings used for the course will be available via ETL.

Outline

Week 1: Introduction to class – energy overview
Required reading:

- IEA, 2025. World Energy Outlook. Executive summary

Week 2 Market efficiency and scarcity pricing
Topics: market efficiency; scarcity pricing; electricity markets; refined products markets.

Week 3 Empirical methods Part 1: Causality, experiments

Week 4 Empirical methods part 2: experiments, diff-in-diff

Week 5 Fossil fuels and Externalities
Topics: trends in oil and gas reserves, optimal extraction

Week 6 Electricity market
Topics: deregulation, the California electricity crisis; the rise and fall of Enron.

Week 7 Energy and environment: global climate change
Topics: climate change impacts; the climate change debate; discounting; risk and uncertainty.

Week 8 paper idea submission --

Week 9 Emissions markets, Cap-and-trade
Topics: basics of cap-and-trade; cost-effectiveness; market design issues in cap-and-trade markets

Week 10 Renewable energy policy
Topics: levelized cost of electricity; environmental benefits of renewables; energy storage basics.

Week 11 Renewable energy policy
Topics: levelized cost of electricity; environmental benefits of renewables; energy storage basics.

Week 12 Renewable energy finance
Topics: tax credits; tax equity; solar leasing; securitization; renewable portfolio standards; (S)RECs; net metering; feed-in tariffs; tenders.

Week 13 Transportation
Topics: demand response, electric vehicles

Week 14 Energy efficiency and standards

Week 15 Final paper presentations