Energy and Environmental Economics (ECON 323)

Spring 2022
SABANCI UNIVERSITY

Lecturer:	Erdal Aydin	**Office Hours:**	Thursday 14:30 – 15:30
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Course Schedule:

- Wednesday/ 14:40 – 15:30 , Thursday / 12:40 – 14:30

- Zoom link: https://sabanciuniv.zoom.us/j/3762788336

Teaching Assistant: Gorkem Akcan (email: gorkemakcan@sabanciuniv.edu)

Course Objective:
This course aims to familiarize students with the economics of energy demand and supply, and the associated environmental issues. It will help students in developing the tools to examine the energy markets and to assess the effectiveness of environmental regulations. We will also cover introductory level data analysis in STATA to analyze some research topics in energy economics field.

Description:
   This course examines energy and environment issues from an economics perspective. The course begins by discussing fundamental concepts in energy economics and related energy statistics. Then, we discuss some basic empirical tools that are used to estimate energy demand elasticities and to forecast future energy demand. Later, we examine the structure of the oil market, focusing on a simple economic model of optimal oil extraction rate. Next, we discuss the drivers and barriers for the diffusion of renewable energy technologies, and examine the effectiveness of policies that are used to support these technologies. We also discuss the effectiveness of environmental regulations such as energy efficiency standards, taxes, subsidies and pollution permit trading. Finally, we incorporate the issue of climate change in the economic analysis, as it is now acknowledged as an important constraint and policies are aimed at decarbonizing the economy.

Prerequisites: ECON204

   **Econometrics (ECON 301) is not a requirement for this course. However, familiarity with econometrics will facilitate your understanding of the empirical topics in the course. In case some students did not take econometrics course, we will cover the basics of econometrics and STATA in the first weeks of the course program.

Required Textbook: We will use the following text book:

- Bhattacharyya, Subhes. 2011. Energy Economics: Concepts, Issues, Markets and Governance. Springer-Verlag.

Grading Policy:
The final grade is based on 5 assignments (50%) and a final exam (50%).

   Assignments:

- There will be 5 assignments (including numerical, data analysis and theoretical questions). Solutions to the assignments must be completed and submitted at SUCourse+. Tentative assignment topics are:

  - 1st assignment: Energy statistics
  - 2nd assignment: Empirical analysis of a research question
  - 3rd assignment: Empirical analysis of a research question
  - 4th assignment: Empirical analysis of a research question
  - 5th assignment: Short research proposal

- Some of the assignments will include questions that requires data analysis in STATA. You will be provided example datasets to answer empirical research questions in Energy Economics literature. In order to get familiar with data analysis, we will cover some simple techniques in data analysis in the first weeks of the course. You will also learn how to install and use STATA during the lectures.

- Solutions to assignments must be completed and submitted individually before the deadlines. For the data analysis type questions, STATA log files MUST be added to your solution sheets. PSs submitted after their deadlines will receive zero credit.

- Some students might be interviewed in order to verify the originality of their solutions.

Final Exam:

- The final exam will be an in-class exam including questions from the contents of each week's course material and interpretation of STATA output tables (you will be provided the STATA results in the exam paper).

Tentative Course Outline:

▌ WEEK 1 : Introduction to Energy Economics:

- Course Overview, History of Energy, Energy Basics, Energy Accounting

▌ WEEK 2 : Energy Statistics

- Energy Statistics, Economics of Energy Demand

▌ WEEK 3 : Introduction to Regression Analysis

- Multiple Linear Regression and Data issues

▌ WEEK 4 : Introduction to STATA

- How to use STATA, Descriptive Analysis, Regression analysis

▌ WEEK 5 : Energy Demand Management

- World Energy Outlook, Energy Demand Management

▌ WEEK 6 : Energy Efficiency

- Energy Efficiency Gap, Rebound Effect

▌ WEEK 7 : Economics of Non-renewable Energy Supply

- Hotelling's Model, Peak Oil Theory

▌ WEEK 8 : Economics of Renewable Energy Supply

- Barriers Facing Renewable Energy, Renewable Energy Support Mechanisms

▌ WEEK 9 : Energy Markets

- Basic Competitive Market Model, Extension of the Basic Model, Market Barriers

▌ WEEK 10 : Oil Industry and the International Oil Market

- History of Oil Industry, Oil Markets and Reserves, OPEC Behavior

▌ WEEK 11 : Economics of Environment Protection

- Pollution, Government Interventions, Valuation of the Environment, Emission Permits

▌ WEEK 12 : Economics of Climate Change

▌ WEEK 13 : The Role of Behavioral Economics in Energy and Climate Policy

▌ WEEK 14 : Review Lecture