

Prof. Dr. Reinhard Madlener, Chair of Energy Economics and Management

Lecture: “Advanced Energy Economics” (v2/Ü2, 18ss-28928)

Course Description

Expanding demand and limited supply will ensure the eventual collapse of the non-renewable fossil fuel economy upon which the modern world is built. At the same time, unrestricted energy use, whether through fossil or biofuels, is a significant contributor to escalating levels of CO₂ and other pollutants. Research and investment in alternative sources of energy is growing rapidly, as well as the use of the renewable energy technologies. Moreover, the policy and the regulation changes affect the transition process of the existing energy system and bring new challenges for the supply side as well as for the demand side of the energy system.

Given these adverse trends, a deep and critical understanding of energy supply and demand/use, and how it impacts our national and global economies, becomes more important with every passing day. This course has been designed to facilitate the development of that understanding. It will contain four basic, described below.

1. The first module explores the dominant theoretical and empirical perspectives on energy and its supply and demand. Students will be introduced to discounting, the standard models of renewable and non-renewable resource extraction and the econometrics of energy systems.
2. The next module focuses on the negative consequences of energy use. Factors affecting energy efficiency and use and modeling issues will be explored. We also look at the problem of pollution and how it can be controlled through economic mechanisms. These mechanisms include energy taxes and tradable carbon permit (or green certificate) markets.
3. The third module focuses on individual sources of energy. We will look at salient aspects of the oil, natural gas, coal, nuclear, biofuel and other alternative energy sectors. There will also be some discussion of energy security, transmission and distribution of electricity and deregulation of the electricity sector.
4. The final module explores risk management in the energy space and familiarizes students with real options modeling, futures markets and derivatives. It concludes with some discussion of energy policies and how they might affect outcomes in the sector.

Organization

Weekly lecture on Monday, 18:15 – 19:45 hrs, 1132/203 (HKW 1). A two-hour weekly exercise units will complement the lecture (Wednesday 12:15 – 13:45 hrs, 1010/141, (IV)). To participate successfully you have to register via CAMPUS and pass the exam (60 minutes) at the end of the course. Course materials will be made available for download on the e-learning platform (L²P).

Target audience

This course is dedicated to master's students in economics and engineering economics, and selected other related fields. In order to find out whether you are allowed to take this course, please get in touch with your study advisor.

Requirements:

Basic knowledge in Economics (Micro/Macro) and Energy Economics

Recommended literature:

1. Perman R., Ma Y., McGilray J. and Common M. (2003). Natural Resource and Environmental Economics, Pearson Education Limited, Harlow.
2. Bhattacharyya S.C. (2011). Energy Economics: Concepts, Issues, Markets and Governance, Springer-Verlag, London/Dordrecht/Heidelberg/New York.
3. Pindyck R. and Rubinfeld D. (2005). Microeconomics, 6th ed., Upper Saddle River, NJ: Prentice Hall.

4. Mulder P. (2005). *The Economics of Technology Diffusion and Energy Efficiency*, Edward Elgar, Cheltenham/UK and Northampton/Mass.
5. Keppler J.H., Bourbonnais R. and Chevalier J. –M. (Eds.) (2007). *The Econometrics of Energy Systems*, Palgrave Macmillan, New York.