Syllabus

Course: Energy and Natural Resource Economics (IKT5131, Gr 1)

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Course objective:
Natural resources and energy constitute vital parts of our everyday life. They affect every sector of the economies. Therefore, understanding and managing energy and resources are crucial for effective entrepreneurship, for economic and institutional development, for healthy environmental standards, and for the functioning of our society in general. The objective of this course is to explore different aspects of energy, electricity, and natural resources and help students learn how to use insights and tools from economics to understand and evaluate resource and energy problems, policies and developments.

Prerequisites:

Although there are no prerequisites for this course, students are expected to have background knowledge in microeconomics (including consumer optimization, producer optimization, social welfare analysis, regulation), be familiar with algebra, and basic game theory (including simultaneous and sequential games with complete information, repeated games, and collusion). Being able to understand and interpret basic econometrics is a plus. Students without the required training can take the course but they need to be prepared to work very hard to keep up with the pace of the course.

Reading assignments:

Every week, you will be assigned reading assignments. I am going to use **Perusall** to give you the reading assignments. This platform will allow you to interact and discuss issues that we will be covering in our lectures. You will be graded according to how well you will perform your reading assignment @Perusall.

@Perusall, your grades are based on your comments on the text (called, annotations), the interactions between other students (e.g., answering their questions, comments etc.), your reading progress, questions etc. For example, if you make a good comment on the text, you will

be graded accordingly. If you make a comment in the form of “yes” or “no” and similar, you will not be graded. You will have a better overview of how things work once you start using Perusall.

*** Perusall:**

1. Enroll to our course on https://perusall.com/ (no need to pay anything). To do this, create a Perusall account and enter your our course code DURMAZ-NHP47 upon registration.
2. The scores of your reading assignments will appear in the Gradebook in our course page in Perusall.
3. Get used to Perusall as quick as possible. Most students unnecessarily get low scores in the initial assignments. Therefore, read, annotate, make good comments, ask good questions, help your friends, answer their questions, and so on. You will get used to Perusall in a very short time if you try hard in the beginning.

Grading:

One mid-term and Perusall grades will constitute 60 percent of your overall grade, while 40 percent will be due to the final exam, adding up to 100 percent. Assignments and quizzes (if any) will also contribute to your overall grade. Assignments are supposed to be typed (not handwritten) and submitted via turnitin.com (to do the plagiarism check). Plagiarism in assignments and cheating in exams will be punished in accordance with the formal procedures.

Online lectures:

The courses will be held online this semester. I encourage you to participate in the class as much as you can. You can ask me questions or make comments any time you like. The more you can get involved the more successful this class will become and certainly more fun for you. To avoid background noise, it is wise to keep your mic off until you would like to participate. I encourage you to turn on your camera to allow for a classroom environment to the best we can. To more you see me and your friends, the more I see you will just make things much more simpler for all of us.

Topics

#1: Introduction to energy - basic principles, definitions, and unit measures (CF, Chapter 1)

- Basic Principles of Energy
- Primary Energy Sources and Energy Carriers
- Energy Units and Energy Measures

#2: Property rights, externalities, and environmental problems (TL, Chapter 2)

- Efficiency
- Property rights
- Market failure: Externalities

#3: Cost-benefit analysis and other decision-making metrics (TL, Chapter 3)

- Normative criteria for decision making
- Applications: Pollution control; Calculating the benefits of CO2 emission reductions; Choosing the discount rate

#4: Dynamic efficiency and sustainability (TL, Chapter 5)

- Two-period model
- Intertemporal fairness
- Sustainability criterion
- Implications for environmental policy

#5: Transition from depletable to renewable resources (TL, Chapters 6 and 7)

- Resource taxonomy
- Natural gas: From price controls to fracking
- Oil: the cartel problem
- Transition to renewables sources of energy
- Rebound and backfire effects

#6: Economics of water (TL, Chapter 9)

- Water scarcity
- Efficient allocation of surface water
- Current allocation system
- Remedies and reforms

#7: Economics of pollution control (TL, Chapter 14)

- Pollution taxonomy
- Cost-effective policies of uniformly mixed pollutants
    - Emissions standards
    - Emissions charges
    - Cap-and-Trade
- Double dividend

#8: Climate Change (TL, Chapter 17 & HSW, Chapter …)

- Science of climate change
- Negotiations over climate change policy
- COP21 (Paris Agreement)

#9: Economics of renewable resources: Fisheries (TL, Chapter 12 & HSW, Chapter 10)

- Efficient harvests
- Public policies toward fisheries

#10: International environmental problems: Conflict and cooperation / strategic interactions (HSW, Chapter 8)

- Common property – common grazing
- Self-governance: escaping the tragedy of the commons
- Co-operative games
- Transboundary pollution control

#11: Climate change and electricity markets (CF, Chapter 24)

- Decarbonization of electricity production
- Renewable energy sources and energy markets after COP21
- Impact of climate change on electricity supply and demand
- Impact of carbon taxes on electricity markets

#12: Renewable sources and electricity production (CF, chapters 25 and 27)

- Levelized cost of electricity
- Renewable energy support policies
    - Price-based support policies
    - Quantity-based support policies
- Smart grids

Course materials:

- Lecture notes.
- (TL) Tietenberg, T. H., & Lewis, L. (2018). Environmental and natural resource economics. Routledge.
- (HSW) Hanley, N., Shogren, J., & White, B. (2019). Introduction to environmental economics. Oxford University Press.
- (CF) Creti and Fontini, 2019: Economics of electricity - Markets, competition and rules, Cambridge University Press