

## Energy Economics and Climate Change Policy (60h – 9CFU)

Prof. Valeria Costantini

[valeria.costantini@uniroma3.it](mailto:valeria.costantini@uniroma3.it)

### Course learning objectives and skill acquisition

This course consists in two modules. The first deals with basic concepts in Energy Economics as the distribution of sources and consumption patterns at the geographical level, the analysis of demand and supply of different energy sources and the use of energy by sectors. World energy outlook scenarios are deeply investigated. The second part of the course allows students gathering main analytical tools to consider jointly energy issues and climate change impacts. The economic analysis of policy impacts over the long term and burden sharing issues in the international bargaining process are also analyzed. At the end of the course students will be able to understand global energy and climate reports, conduct their own impact analysis and be familiar with main simulation models.

### Assessment

The course assessment for attending students is based on two small dissertations that the students write and present after the end of each part of the course, one on Energy Economics and one on Climate Change Policy issues. For non-attending students, the final exam is a discussion with Q&A structure on all topics covered during the course.

### Course general schedule

#### *Part I: Energy Economics*

1. World Energy Outlook
2. Energy security and energy poverty
2. Fossil fuels economics
3. Energy price mechanisms
4. Alternative energy sources and clean energy technologies

#### *Part II: Climate Change Policy*

5. The science of climate change
6. Climate change impacts
7. Vulnerability and adaptation
8. Mitigation policies
7. The European low-carbon strategy

## Teaching material

Teaching material will be available to students in a dedicated OneDrive folder

### Textbooks

Bhattacharyya S.C. (2011), *Energy Economics: Concepts, Issues, Markets and Governance*, UK: Springer-Verlag. *Chapters: 1, 2, 3 (pp. 41-61), 4 (pp.77-81), 5 (sect. 5.1.1-5.1.5), 6 (excl. 6.5), 7 (Appendix excluded for all chapters).*

IEA (International Energy Agency) (2020), *World Energy Outlook 2020. Chapters: 1-2-3-4-5-6-7-8.*

IEA (International Energy Agency) (2016), *Energy Efficiency Indicators. (pages 5-10).*

IPCC (2014), *Climate Change 2014 – Synthesis Report. (pages 1-31).*

IPCC (2014), *Climate Change 2014 – Impacts, Adaptation and Vulnerability Part A. (pages 1-32).*

IPCC (2014), *Climate Change 2014 – Mitigation of Climate Change (pages 41-107).*

Tol R.S.J. (2014), *Climate Economics: Economic Analysis of Climate, Climate Change and Climate Policy*, Edward Elgar Publ. *Chapters: 1,2,3,4,5,6.*

### Compulsory readings

Papers and reports are available in dedicated folders organized by Lecture number as indicated in the detailed teaching agenda.

### Additional sources for intermediate dissertations

This is a list of international scientific journals the student must look at for intermediate dissertations:

- Applied Energy
- Climate Change Economics
- Climatic Change
- Climate Policy
- Global Environmental Change
- Energy Economics
- Energy Journal
- Environment and Development Economics
- Environmental and Resource Economics
- Journal of Environmental Economics and Management
- Resource & Energy Economics

In the OneDrive folder additional sources, papers and reports will be added during the course.

## Detailed teaching agenda

*Lecture #1:* Introduction, practical information, data collection of participants

### *Part I: Energy Economics*

*Lecture #2:* Introduction to the energy markets, composition of the energy mix

*Lecture #3:* Demand and supply, peculiarities of the energy markets

*Lecture #4:* How to read an energy balance: dimensions, sectors, sources

*Lecture #5:* Global energy markets and scenario building

*Lecture #6:* Energy price mechanisms: substitution elasticities

*Lecture #7:* Energy price mechanisms: the rebound effect

*Lecture #8:* Energy security and energy poverty

*Lecture #9:* Renewable sources: introduction and taxonomy

*Lecture #10:* Renewable sources: technological innovation and policy support

*Lecture #11:* The biofuels case: pros and cons of an eco-innovation

*Lecture #12:* Energy efficiency and policy support

*Lecture #13:* The EU Energy strategy: targets and policy instruments

*Lecture #14:* Dissertation on Energy Economics (Part I intermediate assessment)

*Lecture #15:* Dissertation on Energy Economics (Part I intermediate assessment)

### *Part II: Climate Change Policy*

*Lecture #16:* The science of climate change

*Lecture #17:* Climate change impacts and economic damage

*Lecture #18:* Vulnerability and adaptation concepts

*Lecture #19:* The international institutional architecture for climate change

*Lecture #20:* Political bargaining at the international and level

*Lecture #21:* Mitigation actions and policy instruments

*Lecture #22:* The Emission Trading System and the EU experience

*Lecture #23:* The linkages between mitigation and economic performance

*Lecture #24:* Flexible mechanisms and developing countries

*Lecture #25:* The EU long-term low-carbon strategy

*Lecture #26:* Scenario building and policy impact evaluation

*Lecture #27:* The case of the EU long-term low-carbon strategy

*Lecture #28:* The case of the Green Climate Fund

*Lecture #29:* Dissertation on Climate Change Policy (Part II intermediate assessment)

*Lecture #30:* Dissertation on Climate Change Policy (Part II intermediate assessment)