

ENERGY ECONOMICS AND CLIMATE POLICY

Course title - Intitulé du cours	Energy Economics and Climate Policy
Level / Semester - Niveau /semestre	M2 / S2
School - Composante	Ecole d'Economie de Toulouse
Teacher - Enseignant responsable	LAMP, Stefan (TSE)
Other teacher(s) - Autre(s) enseignant(s)	LAFFORGUE, Gilles (TBS)
Other teacher(s) - Autre(s) enseignant(s)	BERMUDEZ, Mauricio (ACCENTURE)
Lecture Hours - Volume Horaire CM	
TA Hours - Volume horaire TD	
TP Hours - Volume horaire TP	0
Course Language - Langue du cours	Anglais
TA and/or TP Language - Langue des TD et/ou TP	

Teaching staff contacts - Coordonnées de l'équipe pédagogique :

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Course's Objectives - Objectifs du cours :

Over the past decades, energy markets have become some of the most dynamic markets of the world economy. Traditional fossil fuel and electricity markets have seen a shift from heavy regulation to market-driven incentives. At the same time, rising environmental concerns led to an array of new regulations and “environmental markets”. The growth of renewable energy is another source of rapid change and brings a new set of technological and policy challenges to the table. This course on “Energy Economics and Climate Policy” is aimed at providing a detailed introduction to issues in energy markets and climate change economics. It is structured in three main blocks.

Block one provides an overview on energy-related economic research. It starts with the discussion of underlying theoretical arguments for environmental regulation and develops on the use of economic incentives (pigovian fees, permit markets) as opposed to more prescriptive types of regulation. This block also discusses theoretical aspects of climate change modeling, taught by Gilles Lafforgue (Toulouse Business School). His lectures will introduce ceiling models and integrated assessment

models that are used to evaluate long-term policies under uncertainty.

Block two transitions to applied topics in energy supply and demand analysis. It will discuss, for example, how increasing supply of renewable (intermittent) energy sources impact electricity markets. The course also analyses demand-side topics such as the energy-efficiency gap and how behavioral economic policies are used to reduce energy consumption.

Finally, **block three** focuses on policy-related questions concerning emission markets, such as the EU-ETS. Mauricio Bermudez Neubauer, principal director at Accenture Strategy, will provide a detailed overview on the evolution of the EU-ETS and discuss challenges in emerging carbon markets. This block also deals with the impact of environmental regulation on firm outcomes and touches on further issues such as the link between development economics and climate change.

Prerequisites - Pré requis :

This course does not have any formal prerequisites; however, it will be useful if students show a good understanding of intermediate microeconomics. Knowledge of applied econometrics (program evaluation) will be useful for the discussion of empirical papers.

Practical information about the sessions - Modalités pratiques de gestion du cours :

This course does not rely on any textbook, but will use a variety of research articles, market data, and policy reports. All assigned readings, except book chapters, will be made available in advance online through the moodle course page. Slides will be made available after each lecture.

Students are expected to read the papers assigned for the class and participate actively in class discussions.

Grading system - Modalités d'évaluation :

Students will be evaluated for the presentation of a research article and a group project. Attendance of the lectures is mandatory and class participation will be part of the final grade.

- Paper presentation (40%)
- Group project (50%)
- Attendance and class participation (10%)

Bibliography/references - Bibliographie/références :

As this is a constantly evolving field, readings are subject to change throughout the semester. The assigned reading will be announced on moodle in advance.

Textbooks (background material)

- Kolstad, Charles D. (2010), *Intermediate Environmental Economics*, 2nd Ed., Oxford University Press
- Fourquet Roger. (editor) (2015), *Handbook on Energy and Climate Change*, Edward Elgar Pub.

Policy Reports

- World Bank (2018), State and Trends of Carbon Pricing
- IEA (2015) Energy and Climate Change, World Energy Outlook Special Edition
- IPCC (2018) Global Warming of 1.5C
- IPCC (2014) 5th Assessment Report (AR5), Climate Change 2014
- RES21 (2016) Renewables 2018, Global Status Report

RESEARCH ARTICLES

Aldy, J. & Pizer W. (2011). The Competitiveness impacts of climate change mitigation policies.

Allcott, H., & Greenstone, M. (2012). Is there an energy efficiency gap? *Journal of Economic Perspectives*, 26(1), 3–28. <http://doi.org/10.1680/ener.2008.161.4.145>

Allcott, H., & Knittel, C. (2017). Are Consumers Poorly Informed about Fuel Economy? Evidence from Two Experiments (No. w23076). National Bureau of Economic Research.

Allcott, H., & Mullainathan, S. (2010). Behavior and Energy Policy. *Science*, 327, 1204–1205.

Borenstein, Severin, James B. Bushnell, and Frank A. Wolak. "Measuring market inefficiencies in California's restructured wholesale electricity market." *American Economic Review* 92, no. 5 (2002): 1376-1405.

Bushnell, J., & Novan, K. (2018). Setting with the Sun: The impacts of renewable energy on wholesale power markets.

Calel, R., & Dechezleprêtre, A. (2016). Environmental Policy and Directed Technological Change: Evidence from the European carbon market. *The Review of Economics and Statistics*, 98(1), 173–191.

Davis, Lucas, and Catherine Hausman. The value of transmission in electricity markets: evidence from a nuclear power plant closure, Working Paper, 2014.

Dechezleprêtre, A., & Sato, M. (2017). The impacts of environmental regulations on competitiveness. *Review of Environmental Economics and Policy*, 11(2), 183-206.

Fabra, N., & Reguant, M. (2014). Pass-Through of Emissions Costs in Electricity Markets. *American Economic Review*, 104(9), 2872-2899.

Fowlie, M., Holland, S., & Mansur, E. (2012). What do emissions markets deliver and to whom? *American Economics Review*, 102(x), 965–993.

Gennaioli, C., Martin, R., and Muûls, M. (2013). Using micro data to examine causal effects of climate policy. In: R. Fouquet (ed.) *Handbook on Energy and Climate Change*

Gillingham, K., & Palmery, K. (2014). Bridging the energy efficiency gap: Policy insights from economic theory and empirical evidence. *Review of Environmental Economics and Policy*, 8(1), 18–38.
<http://doi.org/10.1093/reep/ret021>

Greenstone, M & Gayer, T. (2009). Quasi-experimental and experimental approaches to environmental economics. *Journal of Environmental Economics and Management*, 57(1):21-44

Greenstone, M. (2002). The Impacts of Environmental Regulations on Industrial Activity: Evidence from the 1970 and 1977 Clean Air Act Amendments and the Census of Manufactures. *Journal of Political Economy*, 110(6), 1175–1219.

Greenstone, Michael, and B. Kelsey Jack. "Envirodevonomics: A research agenda for an emerging field." *Journal of Economic Literature* 53, no. 1 (2015): 5-42.

Hsiang, S., & Kopp, R. E. (2018). An Economist's Guide to Climate Change Science. *Journal of Economic Perspectives*, 32(4), 3-32.

Jesoe, K., & Rapson, D. (2014). Knowledge is (Less) Power : Experimental Evidence from Residential Energy Use 1. *American Economic Review*, 104(530), 1417–1438.

Martin, R., Muûls, M., & Wagner, U. J. (2015). The Impact of the European Union Emissions Trading Scheme on Regulated Firms: What Is the Evidence after Ten Years? *Review of Environmental Economics and Policy*

Reguant, M. (2018). The Efficiency and Sectoral Distributional Impacts of Large-Scale Renewable Policies.

Reiss Peter C., & White, M. W. (2008). What changes energy consumption habits? Prices versus public pressures. *RAND Journal of Economics*, 39(3), 636–663.

Session planning - Planification des séances :

The course is organized in 10 sessions of 3 hours each:

1. Introduction, empirical facts, review of regulation principles (LAMP)
2. Climate Change Modeling I (LAFFORGUE)
3. Climate Change Modeling II (LAFFORGUE)
4. Energy supply: electricity markets (LAMP)
5. Energy supply: renewable energy sources (LAMP)
6. Energy demand : energy consumption and energy efficiency (LAMP)
7. Impact of environmental regulation on the regulated industry (LAMP)
8. Policy Session I : European Emission Trading Scheme (BERMUDEZ)

9. Policy Session II : European Emission Trading Scheme, Energy Trading (BERMUDEZ)

10. Additional topics in Climate Change Economics (LAMP)