

Climate and energy economics

Course title - Intitulé du cours	Climate and Energy Economics
Level / Semester - Niveau / semestre	MRes / S2
School - Composante	Ecole d'Economie de Toulouse
Teacher - Enseignant responsable	AMBEC Stefan
Lecture Hours - Volume Horaire CM	15
TA Hours - Volume horaire TD	0
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 Objectives – Objectifs du cours :

Climate change is the greatest market failure the world has seen. Economic growth is coupled with the combustion of fossil energy which, in the long run, modifies the climate and our ecosystems. Tackling climate change requires decoupling economic growth and the use fossil energy by decarbonating our energy mix. We need to invest in renewable sources of energy, to improve energy efficiency, to stop deforestation, to move to cleaner transportation, to reconsider international aid and trade.

The aim of this class is to introduce PhD students to the research frontier in the economics of climate and energy. The focus will be mainly on the transition to decarbonated sources of energy such as solar or wind power. It requires designing climate mitigation policies – such as carbon taxes or feed-in tariffs - and reorganizing the energy sector – regulate electricity provision, transmission, access to the grid, and competition through better market design. The class is at the intersection of two fields in economics: environmental and resource economics, and industrial organization.

Each class will be divided into two parts. In the first part, a topic is introduced by the teacher: research questions, empirical evidence, public policies, mains results. Students are required to read a research paper on that topic for the next class, to write a referee report on that paper and to discuss it during the second part of the next class.

Prerequisites – Pré requis :

Good knowledge of microeconomics, standard econometric methods (both reduced form and structural), and basic mathematics for economists.

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

Lecture notes and papers will be posted on Moodle.

Grading system – Modalités d'évaluation :

Two referee reports (two pages each, 20%), a paper presentation (50%) and participation in class (30%).

Outline :

Class 1: Energy transition and electricity markets

Reading: Ambec, S. and C. Crampes (2019) Decarbonizing electricity generation with intermittent sources of energy, *Journal of the Association of Environmental and Resource Economists* 6(6): 1105-1134.

Reguant, M. (2019) The Efficiency and Sectoral Distributional Implications of Large-Scale Renewable Policies, *Journal of the Association of Environmental and Resource Economists*, 6(1): 129-168.

Holland, S., E. Mansur and A. Yates (2022) Decarbonation and Electrification in the long run, *working paper*.

Paper to be discussed next class: Gonzales, L., K. Ito and M. Reguant (2023) The Investment Effects of Market Integration: Evidence from Renewable Energy Expansion in Chile, *Econometrica*, 91(5): 1659-1693.

Class 2: Fossil fuel

Reading: Covert, T., M. Greenstone and C. Knittel (2016) Will we ever stop using fossil fuels? *Journal of Economics Perspective*, 30(1):117-138.

Coulomb R., F. Henriot and L. Reitzmann (2021) 'Bad' Oil, 'Worse' Oil and Carbon Misallocation, working paper conditionally accepted in *Review of Economic Studies*.

Paper to be discussed next class: Anderson, S., R. Kellogg and S. Salant (2018) Hotelling under Pressure, *Journal of Political Economy*, 126(3) 984-1026

Class 3: Carbon leakage and trade

Reading: Nordhaus, W. (2015) Climate Clubs: Overcoming free-riding in international climate policy, *American Economic Review* 105(4) 1339-1370.

Ambec, S., F. Esposito and A. Pacelli (2024) The economics of carbon leakage mitigation policies, *Journal of Environmental Economics and Management*, 175: 102973.

Paper to be discussed in Class 5: Farrokhi, F., and A. Lashkaripour (2025). Can Trade Policy Mitigate Climate Change? *Econometrica*.

Class 4: Electricity pricing and consumption

Reading: Slides.

Paper to be discussed in Class 5:

Bollinger, B. K. and W. R. Hartmann (2020). Information versus automation and implications for dynamic pricing. *Management Science* 66 (1), 290–314.