Barcelona School of Economics

COURSE SYLLABUS | 23I053

The Energy Transition and Climate Change

3 ECTS | TERM 2 | ELECTIVE

Professors

Bruno Conte and Humberto Llavador

Prerequisites to enroll

None

Overview and objectives

Climate change is arguably the most complex and pressing challenge the world has ever faced. This course attacks this problem from the perspective of economics. It will cover both the science and the economics of climate change, with a combination of positive and normative economic analyses of this problem. The aim is to provide a broad understanding of the relevant economic issues on climate change, the existing debates on the potential mitigation and adaptation policies to address this issue, and the underlying trade-offs behind them. Hopefully, it will expand your view of economics and climate change.

Course outline[1]

1. Climate change for economists (climate science, CO2 cycle, and aggregation, IPCC reports, and RCP scenarios)
2. Climate change in economic models (social and economic impacts of climate change, climate models in economics, and Integrated Assessment Models)
3. Ethics, sustainability, inequality, and climate change
4. The economics of mitigation and international environmental policies (cap-and-trade policies, CO2 taxes, green subsidies)
5. Globalization, climate change, and the low CO2 transition (leakage, CBAM, Kuznetz environmental curve: scale, composition, and technical effects)

Bibliography

During the course, we will provide specific references for each topic. The following books and web page are a good reference and offer an overview of the contents.

- Copeland, B.R. (2013). "*Trade and the Environment*". **Handbook of International Trade**. https://doi.org/10.1007/978-0-230-30531-1_15
- Hassler, J., P. Krusell and C. Olovsson (2020) The Climate and the Economy.
- IPCC (2023) AR6 Synthesis Report: Climate Change 2023
- Llavador, H., J.E. Roemer and J. Silvestre (2015) "*Sustainability for a Warming Planet*". **Harvard University Press**.
- The Climate Impact Lab

Required activities

Class attendance and participation. Presentation of a paper. See below the rules for the presentation and a tentative list of suggested papers.

[1] Subject to slight changes. A final version will be provided at the beginning of the course.

Evaluation

Evaluation will be based on a presentation[2] (40%) and a final exam (60%).

Student presentations

All students enrolled in the course must join a team to present a paper that either deepens the material covered during the course or introduces a new topic. If you have a particular interest, there is the possibility to present a paper outside the list of suggestions provided below. Any proposal requires the prior approval of one of the instructors to make sure it fits within the theme of the course.

Guidelines for Student Presentations

Presentations will be organized **in teams** (whose size will be decided based on the number of students). Whether you choose one of the papers in the list of suggestions or have a personal proposal, you need to **send an email to both instructors with**

- **the complete reference to the paper (title, author, publication…); and**
- **all members of the team in cc.**

The **deadline** to send the mail is **Friday, February 17th.** Papers will be assigned on a first-come, first-serve basis. You should receive a message acknowledging that we got your petition and that the paper was assigned to your team. Otherwise, contact us again.

Presentations will take place during the last two sessions. You must attend all sessions and be ready to present at any time, as the calendar may be altered. There will be 5 presentations for the session and **each team will have 20 minutes** to present, including questions. At the beginning of the session, **one member of each team will be randomly selected to make the presentation.** The other members of the team are expected to help in the presentation by answering questions and providing any necessary clarification.

[2] The presentation grade may be adjusted by the participation during the presentations.

The presentation should contain both methodology and results in a (perhaps unbalanced) combination depending on the nature of the paper. You should motivate the paper, present the model and/or empirical strategy, and highlight the tightness between results and claims made in the introduction and conclusions. You should highlight the main contributions, methodological novelties, and their relevance, and may elaborate on possible limitations of the analysis, indicating directions in which it could be extended, with an emphasis on questions that remain unanswered. You are encouraged to complement your understanding of the paper with related literature.

Keep in mind that the rest of the students in the course are the audience who must be persuaded of the clarity of your presentation and the relevance of the paper. All team members must be ready to make a good presentation.

Tentative list of papers for the presentations:[3]

1. Aghion, P., Dechezleprêtre, A., Hémous, D., Martin, R., & Van Reenen, J. (2016). "*Carbon Taxes, Path Dependency, and Directed Technical Change: Evidence from the Auto Industry*". **Journal of Political Economy**, 124(1), 1–51. https://doi.org/10.1086/684581
2. Andersson, Julius J. (2019). "*Carbon Taxes and CO2 Emissions: Sweden as a Case Study.*" **American Economic Journal: Economic Policy** 11 (4): 1–30. https://doi.org/10.1257/pol.20170144
3. Antweiler, Werner, Brian R. Copeland, and M. Scott Taylor (2001). "*Is Free Trade Good for the Environment?*" **American Economic Review**, 91 (4): 877-908.
4. Balboni, C., Burgess, R., Heil, A., Old, J. and Olken, B.A. (2021). "*Cycles of Fire? Politics and Forest Burning in Indonesia*". **AEA Papers and Proceedings**, vol. 111, pp. 415-419.
5. Balboni, C.A. (2019). "In Harm's Way? Infrastructure Investments and the Persistence of Coastal Cities". Working Paper.
6. Balboni, C., Burgess, R. and Olken, B.A. (2021). "The Origins and Control of Forest Fires in the Tropics". Working Paper.
7. Borenstein, S., Bushnell, J., Wolak, F. A., & Zaragoza-Watkins, M. (2019). "*Expecting the unexpected: Emissions uncertainty and environmental market design*". **American Economic Review**, 109(11), 3953–3977. https://doi.org/10.1257/aer.20161218

[3] An updated list will be provided at the beginning of the course.

8. Calel, R., & Dechezleprêtre, A. (2016). "*Environmental Policy and Directed Technological Change: Evidence from the European Carbon Market*". **Review of Economics and Statistics**, 98(1), 173–191. https://doi.org/10.1162/REST_a_00470
9. Campiglio, E., Dietz, S., & Venmans, F. (2022). "Optimal climate policy as if the transition matters". GRI on Climate Change and the Environment Working Paper.
10. Carattini, Stefano, Steffen Kallbekken, and Anton Orlov. (2019). "*How to Win Public Support for a Global Carbon Tax*." **Nature** 565 (7739): 289–91. https://doi.org/10.1038/d41586-019-00124-x [See also Hagmann, David; Emily H. Ho and George Loewenstein. 2019. "Nudging out Support for a Carbon Tax." **Nature Climate Change**, 9(6), 484-489.]
11. Castro-Vincenzi, J., (2023). "Climate Hazards and Resilience in the Global Car Industry". Working Paper.
12. Copeland, Brian, R., and M. Scott Taylor. (2004). "*Trade, Growth, and the Environment*." **Journal of Economic Literature**, 42 (1): 7-71.
13. Conte, B. (2023). "*Climate Change and Migration: The Case of Africa*". CESifo WP 9948.
14. Conte, B., Desmet, K., & Rossi-Hansberg, E. (2022). "On the Geographic Implications of Carbon Taxes." NBER Working Paper No.30678.
15. Farrokhi, F. and Lashkaripour, A., 2021. "*Can trade policy mitigate climate change?*"
16. Fleurbaey, M., Ferranna, M., Budolfson, M., Denning, F, Mintz-Woo, K., Socolow, R., Spears, D., and Zuber, S. (2019). "*The Social Cost of Carbon: Valuing Inequality, Risk, and Population for Climate Policy*." **The Monist** 102(1):84–109. https://doi.org/10.1093/monist/ony023
17. Goulder, Lawrence H., Marc A.C. Hafstead, Gyu Rim Kim, and Xianling Long. (2019). "*Impacts of a Carbon Tax across US Household Income Groups: What Are the Equity-Efficiency Trade-Offs?*" **Journal of Public Economics** 175 (July): 44–64. https://doi.org/10.1016/j.jpubeco.2019.04.002
18. Hänsel, M. C., Franks, M., Kalkuhl, M., & Edenhofer, O. (2022). "*Optimal carbon taxation and horizontal equity: A welfare-theoretic approach with application to German household data*". **Journal of Environmental Economics and Management**, 116(September), 102730. https://doi.org/10.1016/j.jeem.2022.102730
19. Hsiang, S., Kopp, R., Jina, A., Rising, J., Delgado, M., Mohan, S., Rasmussen, D. J., Muir-Wood, R., Wilson, P., Oppenheimer, M., Larsen, K., & Houser, T. (2017). "*Estimating economic damage from climate change in the United States*". **Science** (New York, N.Y.), 356(6345), 1362–1369. https://doi.org/10.1126/science.aal4369

20. Hsiao, Allan. (2022). "*Coordination and Commitment in International Climate Action: Evidence from Palm Oil*"
21. Hsiao, A., (2023). "*Sea Level Rise and Urban Adaptation in Jakarta*." Working Paper
22. Nath, I.B., (2023). "*The food problem and the aggregate productivity consequences of climate change*" (NBER WP number w27297). National Bureau of Economic Research.
23. Nordhaus, W. (2019). "*Economics of the disintegration of the Greenland ice sheet*". **Proceedings of the National Academy of Sciences**, 116(25), 12261–12269. https://doi.org/10.1073/pnas.1814990116
24. Ohlendorf, Nils, Michael Jakob, Jan Christoph Minx, Carsten Schröder, and Jan Christoph Steckel. (2020). "*Distributional Impacts of Carbon Pricing: A Meta-Analysis*". **Environmental and Resource Economics**. Vol. 78. Springer Netherlands. https://doi.org/10.1007/s10640-020-00521-1
25. Reis, L. A., Drouet, L., & Tavoni, M. (2022). "*Internalising health-economic impacts of air pollution into climate policy: a global modelling study*". **The Lancet Planetary Health**, 6(1), e40–e48. https://doi.org/10.1016/S2542-5196(21)00259-X
26. Renner, S. (2018). "*Poverty and distributional effects of a carbon tax in Mexico*". **Energy Policy**, 112, 98–110. https://doi.org/10.1016/j.enpol.2017.10.011
27. Ricke, K., Drouet, L., Caldeira, K., & Tavoni, M. (2018). "*Country-level social cost of carbon*". **Nature Climate Change**. https://doi.org/10.1038/s41558-018-0282-y
28. Scovronick, N., Budolfson, M. B., Dennig, F., Fleurbaey, M., Siebert, A., Socolow, R. H., Spears, D., & Wagner, F. (2017). "*Impact of population growth and population ethics on climate change mitigation policy*". In **PNAS** (Vol. 114, Issue 46). https://doi.org/10.1073/pnas.1618308114
29. Shapiro, Joseph S. (2021). "*The Environmental Bias of Trade Policy*." **The Quarterly Journal of Economics** 136 (2): 831–86. https://doi.org/10.1093/qje/qjaa042
30. Shapiro, J.S., (2023). "*Institutions, Comparative Advantage, and the Environment*."
31. van der Bergh, J. C. (2017). "*A third option for climate policy within potential limits to growth*". **Nature**, 7(2), 107–112. https://doi.org/10.1038/nclimate3113
32. van der Ploeg, F., J. Emmerling and B. Groom (2022) "*The Social Cost of Carbon with Intragenerational Inequality Under Economic Uncertainty*". CESifo Working Paper No. 9777 http://dx.doi.org/10.2139/ssrn.4127664
33. Zhao, J., & Mattauch, L. (2022). "*When standards have better distributional consequences than carbon taxes*". **Journal of Environmental Economics and Management**. https://doi.org/10.1016/j.jeem.2022.102747