

# Economics of Climate Change (E332)

## Participation

The seminar is open only to students who have been admitted to the seminar by the Studiendekan. Please register for this course on Ilias by October 18, 2021, or earlier.

## Format/Corona

Currently we expect all components of this course to take place in presence. If Corona conditions change, we will move online.

## General orientation and background reading

Students work on one of the specific papers listed below. These papers will be assigned during the introductory session. There will be one paper per student. While students are encouraged to interact, they will be held responsible for their own thesis only. Your thesis should demonstrate that you

- ❖ have full understanding of what is going on in the paper (by explaining it clearly and efficiently)
- ❖ can place the issue in a broader (policy) context.

Note: a good thesis starts with a well-defined research/policy question. It may also present some small modification to the treatment that you find in the original articles. This is, however, not necessary to obtain an excellent grade.

We recommend the following book as a background reading (for the summer holidays):

### Recommend Readings

- Emanuel, K. (2016), [Climate Science and Climate Risk: A Primer](#)
- Gates, B. (2021), How to avoid a climate disaster, Alfred A. Knopf

The first text provides some very basic discussion from the perspective of climate science. Gates' text is an easy read which provides a rather broad, if somewhat superficial discussion of a range of topics at the intersection of economics and climate science. Note: it is not necessary to read any of these texts.

## Time Schedule

**Introductory session (October 20, 12:15, room 207, Nauklerstraße 50):**

In this session, we allocate the papers and discuss organizational details. Allocation of topics will be based on students' preferences.

Two to four weeks after the introductory session, you will have to submit a preliminary outline of your thesis.

## **Presentation sessions/retreat**

Students will present their thesis work during a retreat on January 13-15, 2022, in Bad Herrenalb. Venue: [Haus der Kirche](#). Full meals will be provided; there will be double bedrooms. Participants will contribute EUR50 towards covering the expenses. In addition, students will have to fund their travel expenses. More details will be provided in due course.

Your presentations will be based on a first and preliminary draft of your thesis. You will have to turn in both, the presentation and the preliminary draft of your thesis. During and after the presentation sessions, you will receive feedback. You will subsequently be given further time to take this feedback into account when finalizing your thesis.

### Notes regarding the presentation

- Duration of presentation 30 minutes, including time for clarification questions
- Style: you may use PowerPoint or PDF format
- Note: your presentation should not be longer than 20 slides, it may well be shorter
- Time for discussion of results: 10 minutes
- Submit your slides in PDF format by January 12, 2022, 11 pm via Email (also include your preliminary draft)
- The presentation is not graded, but depending on its quality you may receive valuable feedback

**Deadline for the final version: Monday, January 31, 2022**, via Email.

This adds up to a total of 14 weeks to work on your thesis, which is explained as follows. The thesis earns you **12 ECTS**, which is 2/5 of a semester workload (30 ECTS). Our regulation requires that you be given 10 weeks to work on your thesis. The additional time reflects the fact that you will have to do another 3/5 of the semester workload in other courses at the same time.

### **Style of thesis**

- Length of the thesis must not exceed 20 pages (excluding references and appendix)
- Font: 12-point serif font (e.g. Times New Roman), 1.5 spacing
- Language: English
- Title page must include your name, student ID (Matrikelnummer) and your Email.
- Citation: please apply consistent rules and be sure to cite all sources that you use
- Figures: Key figures should be placed in the main part of the paper; supplementary figures may be placed in the appendix.
- Your introduction should state as well as motivate the research question that you pursue in your thesis
- Be explicit on what is your own view compared to the view of the paper you are discussing
- The conclusion section should offer a brief summary of what you have done and the results you have obtained; it should not bring new subjects.

# Topics

## CATASTROPHES AND RARE DISASTERS

- Barro, R.J., Jin, T., 2021. Rare events and long-run risks. *Review of Economic Dynamics* 39, 1–25. <https://doi.org/10.1016/j.red.2020.08.002>
- Douenne, T., 2020. Disaster risks, disaster strikes, and economic growth: The role of preferences. *Review of Economic Dynamics* 38, 251–272. <https://doi.org/10.1016/j.red.2020.04.007>
- Kotlikoff, L., Kubler, F., Polbin, A., Scheidegger, S., 2021. Pareto-Improving Carbon-Risk Taxation. *Economic Policy*. <https://doi.org/10.1093/epolic/eiab008>
- Martin, I.W.R., Pindyck, R.S., 2015. Averting Catastrophes: The Strange Economics of Scylla and Charybdis. *American Economic Review* 105, 2947–2985. <https://doi.org/10.1257/aer.20140806>

## COSTS AND EFFECTS OF CLIMATE CHANGE

- Acevedo, S., Mrkaic, M., Novta, N., Pugacheva, E., Topalova, P., 2020. The Effects of Weather Shocks on Economic Activity: What are the Channels of Impact? *Journal of Macroeconomics* 65, 103207. <https://doi.org/10.1016/j.jmacro.2020.103207>
- Barrage, L., 2020. The Fiscal Costs of Climate Change. *AEA Papers and Proceedings* 110, 107–112. <https://doi.org/10.1257/pandp.20201082>
- Bauer, M.D., Rudebusch, G.D., 2020. The Rising Cost of Climate Change: Evidence from the Bond Market, Federal Reserve Bank of San Francisco Working Papers No. 2020–25. <https://www.frbsf.org/economic-research/publications/working-papers/2020/25/>
- Colacito, R., Hoffmann, B., Phan, T., 2019. Temperature and Growth: A Panel Analysis of the United States. *Journal of Money, Credit and Banking* 51, 313–368. <https://doi.org/10.1111/jmcb.12574>
- Dell, M., Jones, B.F., Olken, B.A., 2012. Temperature Shocks and Economic Growth: Evidence from the Last Half Century. *American Economic Journal: Macroeconomics* 4, 66–95. <https://doi.org/10.1257/mac.4.3.66>
- Greßer, C., Meierrieks, D., Stadelmann, D., 2021. The link between regional temperature and regional incomes: Econometric evidence with Sub-National data. *Economic Policy*. <https://doi.org/10.1093/epolic/eiab007>
- van den Bremer, T.S., van der Ploeg, F., 2021. The Risk-Adjusted Carbon Price. *American Economic Review* 111, 2782–2810. <https://doi.org/10.1257/aer.20180517>

## COMBATING CLIMATE CHANGE: INNOVATION AND DIRECTED TECHNICAL CHANGE

- 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, 1–51. <https://doi.org/10.1086/684581>
- Fried, S., 2018. Climate Policy and Innovation: A Quantitative Macroeconomic Analysis. *American Economic Journal: Macroeconomics* 10, 90–118. <https://doi.org/10.1257/mac.20150289>
- Hassler, J., Krusell, P., Olovsson, C., 2021. Directed Technical Change as a Response to Natural Resource Scarcity. *Journal of Political Economy* (forthcoming). <https://doi.org/10.1086/715849>

## COMBATING CLIMATE CHANGE: FISCAL POLICY

- Golosov, M., Hassler, J., Krusell, P., Tsyvinski, A., 2014. Optimal Taxes on Fossil Fuel in General Equilibrium. *Econometrica* 82, 41–88. <https://doi.org/10.3982/ECTA10217>
- Hassler, J., Krusell, P., Olovsson, C., Reiter, M., 2020. On the effectiveness of climate policies. Working Paper. <https://www.bde.es/f/webpi/SES/seminars/2020/Fich/sie20200226.pdf>

## COMBATING CLIMATE CHANGE: MONETARY POLICY

- Boser, F., Senni, C.C., 2020. Emission-based Interest Rates and the Transition to a Low-carbon Economy. CER-ETH Working Paper No. 20/337. <https://ethz.ch/content/dam/ethz/special-interest/mtec/cer-eth/cer-eth-dam/documents/working-papers/WP-20-337.pdf>
- Ferrari, A., Nispi Landi, V., 2020. Whatever it Takes to Save the Planet? Central Banks and Unconventional Green Policy, ECB Working Papers, No. 2500. <https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2500~f7a50c6f69.en.pdf>

## COMBATING CLIMATE CHANGE: EVALUATION

- Ben-David, I., Jang, Y., Kleimeier, S., Viehs, M., 2021. Exporting Pollution: Where Do Multinational Firms Emit CO<sub>2</sub>? *Economic Policy*. <https://doi.org/10.1093/epolic/eiab009>
- Fried, S., Novan, K., Peterman, W.B., 2018. The distributional effects of a carbon tax on current and future generations. *Review of Economic Dynamics* 30, 30–46. <https://doi.org/10.1016/j.red.2018.02.001>
- Gillingham, K., Stock, J.H., 2018. The Cost of Reducing Greenhouse Gas Emissions. *Journal of Economic Perspectives* 32, 53–72. <https://doi.org/10.1257/jep.32.4.53>
- Metcalf, G.E., Stock, J.H., 2020. Measuring the Macroeconomic Impact of Carbon Taxes. *AEA Papers and Proceedings* 110, 101–106. <https://doi.org/10.1257/pandp.20201081>
- Tenreyro, S., de Silva, T., 2021. Climate-Change Pledges, Actions and Outcomes. Working Paper. <https://personal.lse.ac.uk/tenreyro/emissions.pdf>

## COMBATING CLIMATE CHANGE: EMISSION TRADING SCHEMES

- Bayer, P., Aklin, M., 2020. The European Union Emissions Trading System reduced CO<sub>2</sub> emissions despite low prices, *PNAS*, 117 (16) 8804-8812; <https://doi.org/10.1073/pnas.1918128117>
- Martin, R., Muûls, M., Wagner U., 2016. The Impact of the EU Emissions Trading System on Regulated Firms: What is the Evidence after Ten Years? *Review of Environmental Economics and Policy*, 10(1). 129-148, <https://doi.org/10.1093/reep/rev016>