WT 2025/26

Debates in Climate Economics

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1. Seminar description

Climate change is among the most pressing challenges of the 21st century. The complexity of climate policy arises from its deep interconnections with science, economics, ethics, and politics. As governments debate ambitious policies—especially in Europe and Germany—on how to decarbonize energy systems, it is crucial to recognize that climate change is a global phenomenon with local, national, and intergenerational consequences. It raises not only technical and economic questions, but also fundamental issues of fairness and political feasibility.

This seminar investigates the economics of climate change with a focus on how economic concepts, models, and controversies shape climate policy. We will explore how economists estimate the damages of climate change and the social cost of carbon, assess the merits and drawbacks of carbon pricing, and examine the distributional effects of these policies within and across countries. We will also engage with broader debates such as green growth versus degrowth, the employment effects of climate policy, and the economic and political feasibility of technologies like geoengineering and carbon capture. The seminar will be interactive and discussion oriented. While critical examination of the scientific literature is at the core, we will also engage with media and policy debates.

The seminar language (including seminar paper, presentation, and discussions) will be English.

2. Organization and Assessment

The seminar will take place as a block seminar and in-person at University Wuppertal.

Registration: To register, please send an email by **September 9, 2025**, to sievert@rwi-essen.de. Please also send your three preferences from the list of topics ordered by priority. Topics will be assigned during the first meeting on October 27th.

Dates and space for events	**Content**
09.09.2025	Deadline for registration
27.10.2025 11h 1 hour, via MS TEAMS	Introduction, assignment of topics
10.11.2025 10-12h Room: M.13.09	Block lecture and Q&A
22.01.2026 23.59h	Deadline for term paper (60% of grade)
29.01.2026 12-17h Room: N.11.16 30.01.2026 10-15h Room: M.16.11	Presentations (Grading: Presentation: 30%; Participation in Class: 10%)

The seminar papers should be written in English and around 10 pages long (12pt, 1 ½ spaced, excluding bibliography and figures). In addition, a title page including a short abstract of about 200-300 words (key questions, main results, summary of critical assessment) has to be composed.

You will be assigned one of the 14 topics below during the introductory session. Each topic comprises 2-4 core papers (note that the number of papers per topic is not a good workload predictor). Your paper should mainly be based on these core papers. You are expected to read the provided literature for your topic very carefully. Including further academic papers into your analysis is welcome, but not mandatory.

We also provide three introductory papers. These are mandatory reading. In your term paper, you are expected to link your topic and core papers to these general papers. Some of the papers are more technical in parts; you are not expected to re-calculate equations or understand all econometric details. Your ambition should rather be to understand and reproduce the intuition behind models and methodological approaches in a non-technical way.

In addition to the introductory papers and core papers, your term paper should link the academic discussion to public debates in policy or media. You are free to pick one or two examples, for instance newspaper articles, influential blogposts, or policy negotiations, announcements and decisions. The aim here is to reflect on the extent to which the academic arguments can be traced into this discussion or not. We will also discuss this briefly during the Q&A session.

In general, the term papers should go beyond the mere summary of the provided literature. Try to be analytical and critical, develop a coherent argument, and draw your own conclusions.

3. Presentation & discussion during the seminar

The presentations should have a maximum length of 25 min, focusing on the main insights of the research papers as well as your critical methodological assessment. Please use presentation slides. You should be able to answer short questions during the presentation. Make sure to keep your audience in mind and prepare a well-structured, interesting, and instructive presentation.

In addition, each student will be assigned another student's paper, which she/he should briefly (**5 min**!) discuss after the presentation. The discussion should be a friendly but critical reflection of the paper and presentation, highlighting strong points as well as critical or unclear points. The discussant should also come up with one or two questions to start the discussion.

In general, your active discussion in the seminar is essential to this course and also enters the grade. Therefore, it is expected that all participants have at least skimmed through the literature assigned to the other topics (e.g. read abstract, introduction and summary), so that an informed discussion can take place after the presentation. Nevertheless, stating personal opinions and value judgements is highly encouraged and explicitly desired.

4. Literature & Topics[1]

Introduction: Climate change economics (mandatory reading)

Tol, R. S. (2018). The economic impacts of climate change. *Review of Environmental Economics and Policy*, 12(1), 4-25.

Burke, M., Craxton, M., Kolstad, C. D., Onda, C., Allcott, H., Baker, E., ... & Greenstone, M. (2016). Opportunities for advances in climate change economics. *Science*, *352*(6283), 292-293.

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

1. Climate change damage estimates

Nordhaus, W. (2014). Estimates of the social cost of carbon: concepts and results from the DICE-2013R model and alternative approaches. *Journal of the Association of Environmental and Resource Economists*, *1*(1/2), 273-312.

Tol, R. S. J. (2024). A meta-analysis of the total economic impact of climate change. *Energy Policy*, *185*, 113922.

2. Social costs of carbon & discounting

Gollier, C. and Hammitt, J.K., (2014). The long-run discount rate controversy. *Annual Review of Resource Economics*, *6*(1), pp.273-295.

Heal, G.M. and Millner, A., (2014). Agreeing to disagree on climate policy. *Proceedings of the National Academy of Sciences*, *111*(10), pp.3695-3698.

Pindyck, R. S. (2019). The social cost of carbon revisited. *Journal of Environmental Economics and Management*, *94*, 140-160.

3. Green growth vs degrowth

Kallis, G., Kerschner, C., & Martinez-Alier, J. (2012). The economics of degrowth. *Ecological Economics*

Hickel, J., & Kallis, G. (2019). Is green growth possible? *New Political Economy,* 1-18.

Jakob, M., & Edenhofer, O. (2014). Green growth, degrowth, and the commons. *Oxford Review of Economic Policy, 30*(3), 447-468.

4. Climate policy and job market effects

Gray, W. B., Shadbegian, R. J., Wang, C., & Meral, M. (2014). Do EPA regulations affect labor demand? Evidence from the pulp and paper industry. *Journal of Environmental Economics and Management, 68*(1), 188-202.

[1] The topics will not necessarily be presented in the same order as presented here.

Weber, J. G. (2020). How Should We Think about Environmental Policy and Jobs? An Analogy with Trade Policy and an Illustration from US Coal Mining. *Review of Environmental Economics and Policy, 14*(1), 44-66.

5. Carbon pricing: The first-best solution?

Döbbeling-Hildebrandt, N., Miersch, K., […] and Koch, N., (2024). Systematic review and meta-analysis of ex-post evaluations on the effectiveness of carbon pricing. *Nature Communications*, *15*(1), p.4147.

Green, J.F., (2021). Does carbon pricing reduce emissions? A review of ex-post analyses. *Environmental Research Letters*, *16*(4), p.043004.

Vrolijk, K. and Sato, M., (2023). Quasi-experimental evidence on carbon pricing. *The World Bank*
Research Observer, *38*(2), pp.213-248.

6. Carbon pricing: Distributional impacts

Ankel-Peters, J., Bensch, G., Dabadge, A., Munyehirwe, A., Rose, J., Sievert, M., Nshakira-Rukundo, E., and Lay, J., (2025). Tax carbon cautiously for sub-Saharan Africa. *Nature Climate Change*, *15*(1), pp.7-9.

Dorband, I. I., Jakob, M., Kalkuhl, M., & Steckel, J. C. (2019). Poverty and distributional effects of carbon pricing in low-and middle-income countries–A global comparative analysis. *World Development, 115*, 246-257.

Gill, B., & Moeller, S. (2018). GHG emissions and the rural-urban divide. A carbon footprint analysis based on the German official income and expenditure survey. *Ecological Economics, 145*, 160-169.

7. Global equity and fairness

Fanning, A.L. and Hickel, J., 2023. Compensation for atmospheric appropriation. *Nature Sustainability*, *6*(9), pp.1077-1086.

Prest, B.C., Rennels, L., Errickson, F., and Anthoff, D., 2024. Equity weighting increases the social cost of carbon. *Science*, *385*(6710), pp.715-717.

8. Geoengineering

Irvine, P. J., Kravitz, B., Lawrence, M. G., Gerten, D., Caminade, C., Gosling, S. N., ... & Oschlies, A. (2017). Towards a comprehensive climate impacts assessment of solar geoengineering. *Earth's Future, 5*(1), 93-106.

Corry, O. (2017). The international politics of geoengineering: The feasibility of Plan B for tackling climate change. *Security Dialogue, 48*(4), 297-315.

Heutel, G., Moreno-Cruz, J., & Ricke, K. (2016). Climate engineering economics. *Annual Review of Resource Economics, 8,* 99-118.

9. Carbon capture and storage

Alcalde, J., Flude, S., Wilkinson, M., Johnson, G., Edlmann, K., Bond, C. E., ... & Haszeldine, R. S. (2018). Estimating geological CO2 storage security to deliver on climate mitigation. *Nature Communications, 9*(1), 1-13.

Minx, J. C., Lamb, W. F., Callaghan, M. W., Fuss, S., Hilaire, J., Creutzig, F., ... & Khanna, T. (2018). Negative emissions—Part 1: Research landscape and synthesis. *Environmental Research Letters, 13*(6), 063001.

Fuss, S., Lamb, W. F., Callaghan, M. W., Hilaire, J., Creutzig, F., Amann, T., ... & Luderer, G. (2018). Negative emissions—Part 2: Costs, potentials and side effects. *Environmental Research Letters, 13(*6), 063002.

Morrow, D. R., Thompson, M. S., Anderson, A., Batres, M., Buck, H. J., Dooley, K., ... & Noël, J. (2020). Principles for Thinking about Carbon Dioxide Removal in Just Climate Policy. *One Earth*, *3*(2), 150-153.

10. Carbon Finance & Article 6 mitigation

Probst, B. S., Toetzke, M., Kontoleon, A., Díaz Anadón, L., Minx, J. C., Haya, B. K., Schneider, L., Trotter, P. A., West, T. A. P., Gill-Wiehl, A., & Hoffmann, V. H. (2024). Systematic assessment of the achieved emission reductions of carbon crediting projects. *Nature Communications*, *15*(1), 9562.

West, T. A. P., Wunder, S., Sills, E. O., Börner, J., Rifai, S. W., Neidermeier, A. N., Frey, G. P., & Kontoleon, A. (2023). Action needed to make carbon offsets from forest conservation work for climate change mitigation. *Science*, *381*(6660), 873–877.

11. The Green Paradox

Jensen, S., Mohlin, K., Pittel, K., & Sterner, T. (2015). An introduction to the green paradox: the unintended consequences of climate policies. *Review of Environmental Economics and Policy, 9*(2), 246-265.

Van der Ploeg, F., & Withagen, C. (2015). Global warming and the green paradox: A review of adverse effects of climate policies. *Review of Environmental Economics and Policy*, *9*(2), 285-303.

Sinn, H. W. (2015). Introductory Comment–The Green Paradox: A Supply-Side View of the Climate Problem. *Review of Environmental Economics and Policy*, *9*(2), 239-245.

12. Coal renaissance

Kalkuhl, M., Steckel, J. C., Montrone, L., Jakob, M., Peters, J., & Edenhofer, O. (2019). Successful coal phase-out requires new models of development. *Nature Energy, 4*(11), 897-900.

Jakob, M., Steckel, J. C., Jotzo, F., Sovacool, B. K., Cornelsen, L., Chandra, R., ... & Robins, N. (2020). The future of coal in a carbon-constrained climate. *Nature Climate Change*, *10*(8), 704-707.

Steckel, J. C., Edenhofer, O., & Jakob, M. (2015). Drivers for the renaissance of coal. *Proceedings of the National Academy of Sciences, 112*(29), E3775-E3781.

Steckel, J. C., Hilaire, J., Jakob, M., & Edenhofer, O. (2020). Coal and carbonization in sub-Saharan Africa. *Nature Climate Change, 10*(1), 83-88.

13. Scientific consensus and the Intergovernmental Panel on Climate Change

Hulme, M., 2022. Scientific consensus seeking. *In:* De Pryck, K. and Hulme, M. (eds.) A critical assessment of the Intergovernmental Panel on Climate Change. Cambridge University Press, pp. 178. https://www.cambridge.org/core/books/critical-assessment-of-the-intergovernmental-panel-onclimate-change/scientific-consensusseeking/50A8E2D67589C12FA3C96E83A602E8B6

Hulme, M., 2024. 'IPCC-envy': Why do other science-policy issues want an IPCC, and should they?. *Dialogues on Climate Change*, *1*(1), pp.7-11.

Beatty J., and Moore A., 2010. Should We Aim for Consensus? *Episteme, 7*(3), pp.198-214.

14. Beyond the naïve evidence-based policy paradigm: Incredible certitude, expertise and reasoned intuition

Ankel-Peters, J. and Schmidt, C.M., 2024. Rural electrification, the credibility revolution, and the limits of evidence-based policy. Environment and Development Economics, pp.1-12.

Basu, K., 2014. Randomisation, causality and the role of reasoned intuition. Oxford Development Studies, 42(4), pp.455-472.

Collins, H.M. and Evans, R., 2002. The third wave of science studies: Studies of expertise and experience. Social studies of science, 32(2), pp.235-296.

Manski, C.F., 2020. The lure of incredible certitude. Economics & Philosophy, 36(2), pp.216-245.