

2nd Workshop

Macroeconomic Perspectives on Climate Change

May 22, 2026

9:00-9:05

Opening remarks

Marten Hillebrand, University of Freiburg

9:10-10:00

A macro study of wildfire risk and adaptation

Stephie Fried, Federal Reserve Bank
of San Francisco

10:00-10:15 Coffee break

10:15-11:05

**Optimal climate policy as if
the transition matters**

Simon Dietz, London School of Economics

11:10-12:00

Climate-economy analysis in the wide world

Conny Olovsson, Sveriges Riksbank

12:00-14:00

Conference lunch

Haus zur Lieben Hand, Löwenstraße 16

14:00-14:50

**Climate transition risk in a
non-cooperative world**

Christoph Hambel, Tilburg University

14:55-15:45

**Fueling energy transition: Capital dynamics
from energy supply to manufacturing sectors**

Aleksandra Friedl, ifo Institute

15:45-16:15 Coffee break

16:15-17:05

Self-enforcing stable sets

Christian P. Traeger, University of Oslo

17:10-18:00

Climate policy and international risk sharing

Marten Hillebrand, University of Freiburg

19:00

Conference dinner

Greiffenegg Schlössle, Schlossbergring 3

- » Each talk should last about 35-40 minutes, followed by 10-15 minutes of discussion.
- » All talks take place in Rempartstrasse 16, room 02-012 (2nd floor).
- » Office space is available in room 04-015 (4th floor).
- » The conference lunch takes place at Haus zur Lieben Hand, Löwenstraße 16, 79098 Freiburg.
- » The conference dinner takes place at Greiffenegg Schlössle, Schlossbergring 3, 79098 Freiburg.
- » Generous financial support by the FWW is gratefully acknowledged.



Macroeconomic Perspectives on Climate Change

May 22, 2026

University of Freiburg • Chair of Economic Theory, esp. Macroeconomics

Conference Program

A macro study of wildfire risk and adaptation

Authors: **Stephie Fried (Federal Reserve Bank, San Francisco)**

Abstract: Wildfires are an increasingly prominent form of climate damage, representing simultaneous shocks to household wealth and shelter. Households can mitigate fire risk by investing in hardening measures such as defensible space or fire-resistant materials, which generate positive spillovers for neighbors, and by purchasing insurance, which in some places has historically underpriced fire risk. This paper develops a heterogeneous agent overlapping generations model with housing in which households face idiosyncratic income and fire shocks and make decisions over fire hardening and insurance. Preliminary results indicate that fire risk reduces homeownership rates and shifts households toward smaller houses, with welfare costs borne disproportionately by lower-income households. We use the model to evaluate mandatory hardening, adaptation subsidies, and insurance market reform.

Optimal climate policy as if the transition matters

Authors: Emanuele Campiglio (University of Bologna), **Simon Dietz (London School of Economics)**, Frank Venmans (London School of Economics)

Abstract: We study optimal climate policy when the low-carbon transition is constrained by frictions in scaling clean energy and retiring fossil assets. We develop a stochastic, quantitative, intertemporal general-equilibrium model with heterogeneous dirty capital disciplined using firm-level data and adjustment costs disciplined using evidence on historical energy-system expansions and phase-outs. The data reveal an important “dirty tail” of highly emissions-intensive assets that can be retired early at low cost. This means that, despite transition frictions, optimal policy entails rapid near-term decarbonisation, with emissions halving in the first ten years. The transition is not primarily constrained by the cost of stranding dirty capital, but by the rate at which clean capital can be expanded. Our results highlight the importance of modelling heterogeneity in emissions intensity and support policies targeting high-emissions assets and easing clean investment constraints.

Climate-economy analysis in the wide world

Authors: John Hassler (Stockholm University), Per Krusell (Stockholm University), **Conny Olovsson (Sveriges Riksbank)**

Abstract: We construct a dynamic integrated assessment model of climate and the economy with very high geographic resolution. Migration is free within, but not allowed across, countries. The model parameterization uses a wealth of data, including the distribution of output, population, energy sources and use, and estimates of the local damages from climate change. It implies very large geographic dispersion in damages from warming. We conduct three kinds of policy experiments. In one, we note that a modest, uniform carbon tax limits global warming and damages around the world substantially. In a second experiment we let the poorest countries not tax carbon, while the rest compensate by setting higher taxes; the efficiency losses are large. In a final experiment we find that fast green technology growth alone is a poor substitute for carbon taxes, whether globally available or not.

Climate transition risk in a non-cooperative world

Authors: Djep Dorelijers (Tilburg University), **Christoph Hambel (Tilburg University)**, Rick van der Ploeg (University of Oxford)

Abstract: We develop a tractable multi-country framework of climate risk with endogenous growth, international trade, recursive preferences, and strategic climate policy interactions. Countries transition between business-as-usual, moderate climate policy, and ambitious climate policy with transitions between regimes governed by a political Markov chain. We derive closed-form solutions for the social cost of carbon, optimal controls, and equilibrium exchange rates. We show that political transition risk affects asset prices through precautionary savings channels distinct from climate and macroeconomic disaster risk. Our calibration strategy matches both macroeconomic moments and asset pricing data across multiple regions, providing quantitative insights into the economic costs of policy uncertainty and delayed climate action in a non-cooperative world.

Fueling energy transition: Capital dynamics from energy supply to manufacturing sector

Authors: Lea Best (ifo), **Aleksandra Friedl (ifo)**, Pauline Chikhani (University of Lausanne), Andreas Peichl (ifo), Karen Pittel (ifo)

Abstract: This paper examines how the interaction between the electricity and manufacturing sectors shapes the speed and cost of decarbonization. We develop a two-sector framework in which manufacturing firms combine neutral capital with both purchased electricity and self-generated clean energy, while a monopolistic electricity sector produces power using dirty and clean capital. The model features four types of capital - neutral manufacturing, clean manufacturing, dirty

electricity, and clean electricity - which allows us to capture the growing tendency of manufacturing firms to invest in on-site renewable generation. Our results show that a carbon tax on dirty electricity triggers simultaneous adjustments across both sectors. Manufacturing firms endogenously change the balance between purchased and self-produced electricity, and their response depends on technological characteristics and substitution possibilities across energy sources. This shift dampens capital reallocation within the electricity sector but can accelerate overall emissions reductions. Self-generation for manufacturing may represent an underexplored policy lever to accelerate emissions reductions by shifting part of the transition burden from electricity producers to industrial firms.

Self-enforcing Stable Sets

Authors: Hiroaki Sakamoto (Kobe University), **Christian Traeger (University of Oslo)**

Abstract: We study coalition formation with externalities under voluntary, non-binding participation. Motivated by climate agreements, where standard modeling predicts small, inefficient coalitions, we propose a new solution concept—the self-enforcing stable set. It synthesizes the self-enforcing logic of non-cooperative approaches with the consistency requirement of cooperative forward-looking stability. By endogenizing players' beliefs about the eventual outcomes of negotiations, we show that rational foresight disciplines strategic free-riding and selects constrained Pareto efficient outcomes. In canonical climate-agreement models, this yields sharp predictions: stable coalitions must be large and only mildly fragmented, aligning closely with observed participation patterns.

Climate policy and International Risk Sharing

Authors: Markus Epp (University of Freiburg), **Marten Hillebrand (University of Freiburg)**

Abstract: We study the strategic interaction among heterogeneous countries in a stochastic growth model of climate change. Each country is exposed to exogenous fundamental and endogenous climate risk determined by global temperature. We analyze alternative market arrangements determining the extent of trade and international capital flows as well as the scope for risk sharing through financial markets. We provide analytical characterizations of optimal climate policies under non-cooperation and full cooperation and show how these policies depend on the underlying market structure. Numerical simulations quantify the welfare gains from trade and financial risk sharing, as well as from cooperation in addressing the climate externality. In the absence of cooperation, introducing risk-sharing opportunities through financial markets tends to benefit countries that are less exposed to climate change, while more exposed countries gain only when direct international capital investment is feasible. Quantitatively, we find that the combined gains from financial market openness and trade are substantially larger than those achieved through cooperation under international climate agreements.