



## University of Cologne

Department of Economics – Chair in Economics, Energy and Sustainability

### Seminar: Energy, Climate Change and Ecological Economics

Summer Term 2024

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*“Ecological economics acknowledges that real economies are completely dependent on energy. However, orthodox economic theory remains blind to this reality. As a result, so do our institutions and our citizenry.”<sup>1</sup>*

Ever since the industrial revolution, humanity has grown increasingly used to the material and energy surplus that has been created using finite fossil fuels rather than the (on human-scale) infinite solar energy, especially since the use of fossil fuels can be regulated to meet short-term demand. In our globalized world, the transgression of six of the nine planetary boundaries<sup>2</sup>, largely due to the burning of fossil fuels and subsequent emission of CO<sub>2</sub> and other greenhouse gases, increasingly indicates the need for a shift in economic practices and energy generation. To achieve this change, many governments have established goals to mitigate further climate change. Germany has set ambitious climate targets, including climate neutrality by 2045 and a reduction of emissions compared to 1990 levels by 65% by 2030.

As a consequence, ecological economics has made it its mission to include constraints given by energy and resource stocks and flows in the natural environment into economic considerations and systems and hence think of the human economy as embedded within the biosphere.

The seminar provides an overview of the currently observed interactions between energy, climate change and the economy as well as the social inequalities connected to them. Together, we are looking into current research on the building sector.

The building sector, comprising residential and non-residential buildings, directly accounted for 15 % of Germany’s greenhouse gas (GHG) emissions in 2021. Most of these emissions arise from the transformation of energy carriers within the buildings, especially for heating. Reducing carbon emissions in the building sector poses various issues and challenges. On the one hand, technical efficiencies can be increased, which requires time and effort. On the other hand, building space and comfort levels have continuously increased – at least partially compensating for the efficiency gains obtained. Therefore, students are asked to look into the current research on topics such as the transition towards climate neutral space heating and hot water generation in residential buildings, minimum energy requirements and incentives to shift towards highly energy efficient (rental) residential buildings.

<sup>1</sup>Hagens N.J. (2020), *Economics for the future – Beyond the superorganism*. In: Ecological Economics Vol. 169

<sup>2</sup>Richardson K. et al. (2023), *Earth beyond six of nine planetary boundaries*. In: Science Advances Vol. 9 Issue 37

<sup>3</sup>Bundesregierung (2021), *Intergenerational contract for the climate*. Climate Change Act: climate neutrality by 2045. (bundesregierung.de)

## Application

Since only a limited number of students can take part in the seminar, it is advisable to register as soon as possible (best first registration period).

Only those placed in the seminar can register for the examination. Thus, if you decide to not take the seminar, please make sure to deregister from the course so your peers are able to enroll for the remaining spots before the exam registration phase ends!

## Mode of Examination: combined examination

The final grade consists of:

- 50% Seminar Paper (max 3000 words)
- 50% Presentation (10 minutes)

Both the seminar paper and the presentation have to be passed in order to pass the seminar.

## General Requirements

The seminar is designed for advanced students with a specialization in economics. The seminar participants are expected to gain in-depth insights into their topic independently.

While overall topics will be distributed, students are expected to determine the focus of their seminar paper themselves. Furthermore, students should deal critically with the contributions of other participants. Active participation in the seminar discussion is expected. We provide a guideline for the preparation of seminar papers. This includes all design requirements.

## Further Information

<b>Credits</b>	6
<b>Language</b>	English
<b>Examiner</b>	Cordelia Frings
<b>Organization</b>	Please contact Cordelia Frings in case you have any questions about the seminar (cordelia.frings@uni-koeln.de)
<b>Schedule</b>	A detailed schedule with all dates relevant for the examination will be provided in the introductory session. Until then, please refer to the information in KLIPS.