

## **Changes in income of different household types and the impact on UK consumption-based emissions and climate policy**

Topic: Sustainable production and consumption II (Chair: Shuning Chen, Kyushu University)

Author: Lena Kilian

Co-Authors: Anne OWEN, Andy Newing, Diana Ivanova

Higher income is frequently seen as a key driver for higher consumption-based emissions. Despite this, economic emission reduction policies often disproportionately affect lower income households. Thus, understanding the goods and services different types of households consume at different income levels is key to understanding how policy can reduce emissions of those emitting the most. Similarly, understanding how income reductions shape emissions of different household types can be critical. To assess this, we use an environmentally-extended multi-regional input-output analysis to estimate consumption-based greenhouse gas emissions for 4000-6000 UK households annually from 2001-2020. Data used to estimate these come from the UK's multi-regional input-output model and the Living Costs and Food survey, an annual household expenditure survey. We analyse these emissions longitudinally at a product level. Importantly, we look at emissions in a time period with two major income changes: the economic recession in 2007, and the COVID-19 pandemic in 2020. The former reveals how emissions change with income reductions, while the latter shows how emissions change with income uncertainty and government mandated lifestyle changes. This can reveal where emissions decrease because of these changes and where they remain stable or increase. These results can inform policy by showcasing the importance different household types place on different goods and services even after income reductions, uncertainty, and lifestyle changes. For instance, this research can reveal the impact carbon taxes might have on different goods and services, as it shows which goods and services different household types consume less of at lower income levels. This can aid the design of socially just emission reduction policies; knowing how households at different income levels change consumption with income reduction and uncertainty allows for the design of climate policy which targets the reduction of emissions of higher income households and the redistribution of carbon emissions from necessities.