

Peer Review

Review of: "Carbon Inequality: Resolving Contradictory Results From Two Different Approaches"

Eric Hartmann¹

1. Leuphana University, Lüneburg, Germany

The paper elaborates on an interesting synthesis of current debates regarding sustainability, inequality, and population growth in the realm of climate change mitigation. It particularly focuses on individual-level and country-level approaches to investigate carbon inequality.

Specific comments:

- An outline of the following structure and arguments (at the end of the introduction, p. 2) would enhance reader guidance.
- In your discussion of different approaches to attribute emissions from infrastructures and public interests to individuals (p. 5), you left out another important aspect, namely the power of decision. Investors have the power to decide how their money is invested and hence can influence the resulting emissions, while these emissions often are not even transparent to consumers.
- Regarding chapter 3.1 *"Cutting consumption of the wealthy is the solution"*, I have several remarks:
 - *'When focusing on consumption alone, research shows that the carbon footprint is proportional or less than proportional to income. This is also in line with Chancel's data, showing that — when investments are excluded — the emissions of the top 10% are lower than the emissions of the middle 40%, hence not confirming the champagne-coupe distribution.'* (p. 6)

In my eyes, this passage implies that there is no relevant difference between the different groups regarding carbon emissions. However, even with proportional or less than proportional correlations between income and carbon footprints, the top 10% will emit way more than the middle 40%, which again will emit way more than the lower 50%. Hence, the importance of wealth and inequality still stands, which should be made explicit.

- *'As a consequence, even if the richest stopped investing, other investors might exploit the existing demand for those goods and services. Shifting investments from wealthier to poorer individuals may make societies more equal but would not necessarily lower overall GHG emissions.'* (p. 6)

This implies an individual decision of the richest persons regarding their investments without any incentives or regulation. The compensating effects could be lowered, e.g., through public policy, state intervention, or international agreements, targeting all investors (in a certain region). This should be considered. The same holds for the statement *'as long as there is a demand, someone will invest to satisfy it'* (p. 9).

- *'Conversely, cutting investments, as well as cutting excessive consumption of wealthy people, would possibly lead to a reduction in GHG emissions but also to higher prices and reduced job opportunities, with consequent impoverishment of the general population.'* (p. 7)

What about greening the investments? Hence, fostering green investments and punishing fossil investments?

Additionally, the dependency of the economy and general well-being on economic growth is important here. Recently, the degrowth scholarship and movement strongly stress the necessity to reduce this dependency to foster sustainability and climate justice.

- Overall, a more nuanced headline regarding carbon inequality could be *'setting boundaries for the wealthy'* instead of *'cutting consumption of the wealthy is the solution'* (p. 6), considering the arguments I made above and preventing the straw man fallacy.
- *'Our country-level analysis corrects this picture. The 10% of people living in the richest countries are not responsible for half of global emissions, but for about one fourth (see fig. 1, panel B). They do have higher average individual emissions than citizens of poorer countries, but the difference is less extreme and the champagne coupe shape of the graph is lost.'* (p. 7)

Yet, your country-level analysis still shows drastic inequalities, as the lower 50% only cause 19.2% of the 2019 emissions. Hence, your approach does not disprove the role of striking international inequality but rather shifts focus from the top 10% to the top 50% of the world.

- I really like your final shift to *'distinguishing between reasonable and excessive consumption'* (p. 8). In this context, I miss the necessity to green the remaining reasonable consumption, particularly through (more) consistent technologies like renewable energy. Furthermore, recent conceptual developments utilizing the term *sustainability strategies* could be insightful for your perspective (Hartmann, 2025. Sustainability strategies: What's in a name? <https://doi.org/10.1002/sd.3443>). The framework of sustainability strategies combines matters of reasonable and excessive consumption (strategies:

sufficiency and capability empowerment), the importance of population growth (strategy: population reduction), carbon inequality (strategy: equalization), as well as greening remaining consumption, production, and investments (strategies: efficiency increase, consistency increase, regeneration expansion). Seemingly, the interaction between these levers is of particular interest for your work.

Declarations

Potential competing interests: No potential competing interests to declare.