

LTH  
FACULTY OF  
ENGINEERING

# Climate Crisis and Global Inequality

JOACHIM PETER TILSTED, IMES, LTH

UNEQUAL CONSEQUENCES

UNEQUAL RESPONSIBILITY AND  
MITIGATION OBLIGATIONS

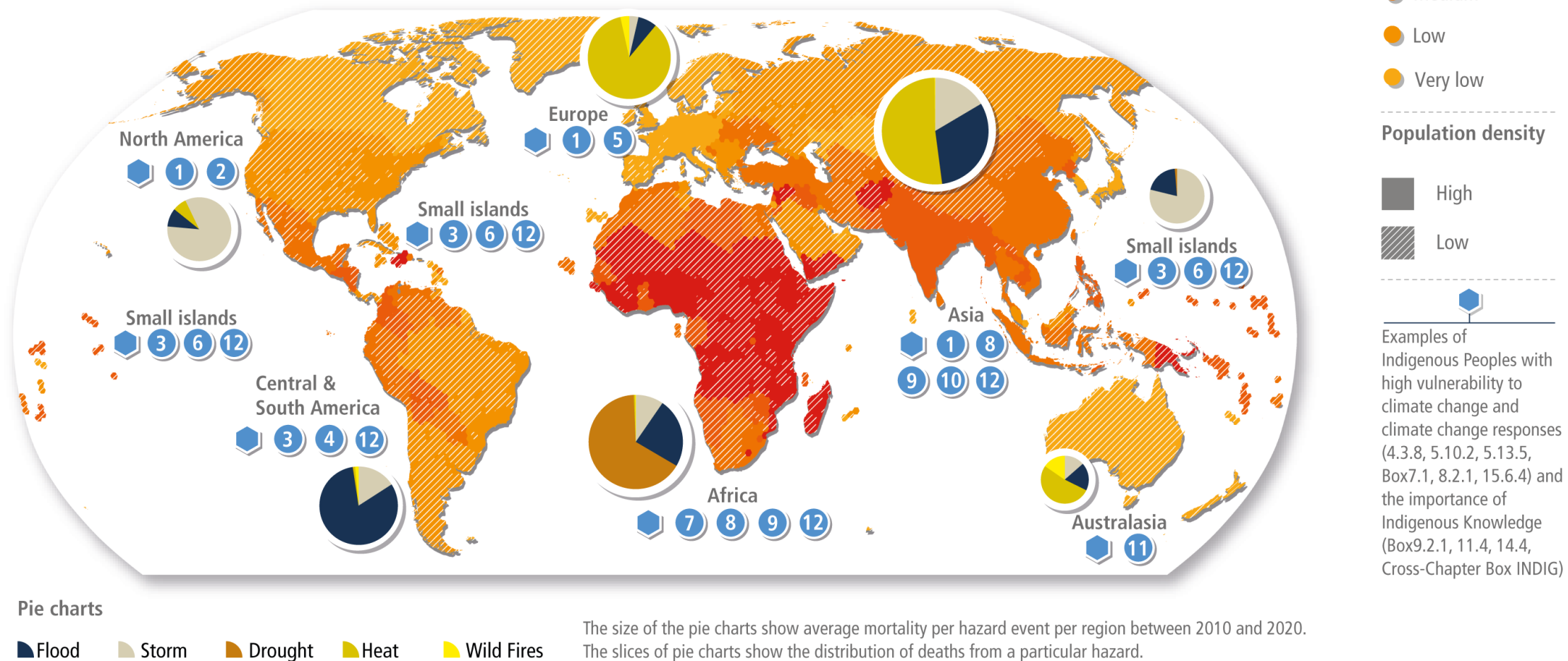
INEQUALITY ALONG DIFFERENT  
DIMENSIONS

NOTES ON THE NOTION OF A  
JUST TRANSITION

# UNEQUAL CONSEQUENCES

## Observed human vulnerability to climate change is a key risk factor and differs globally

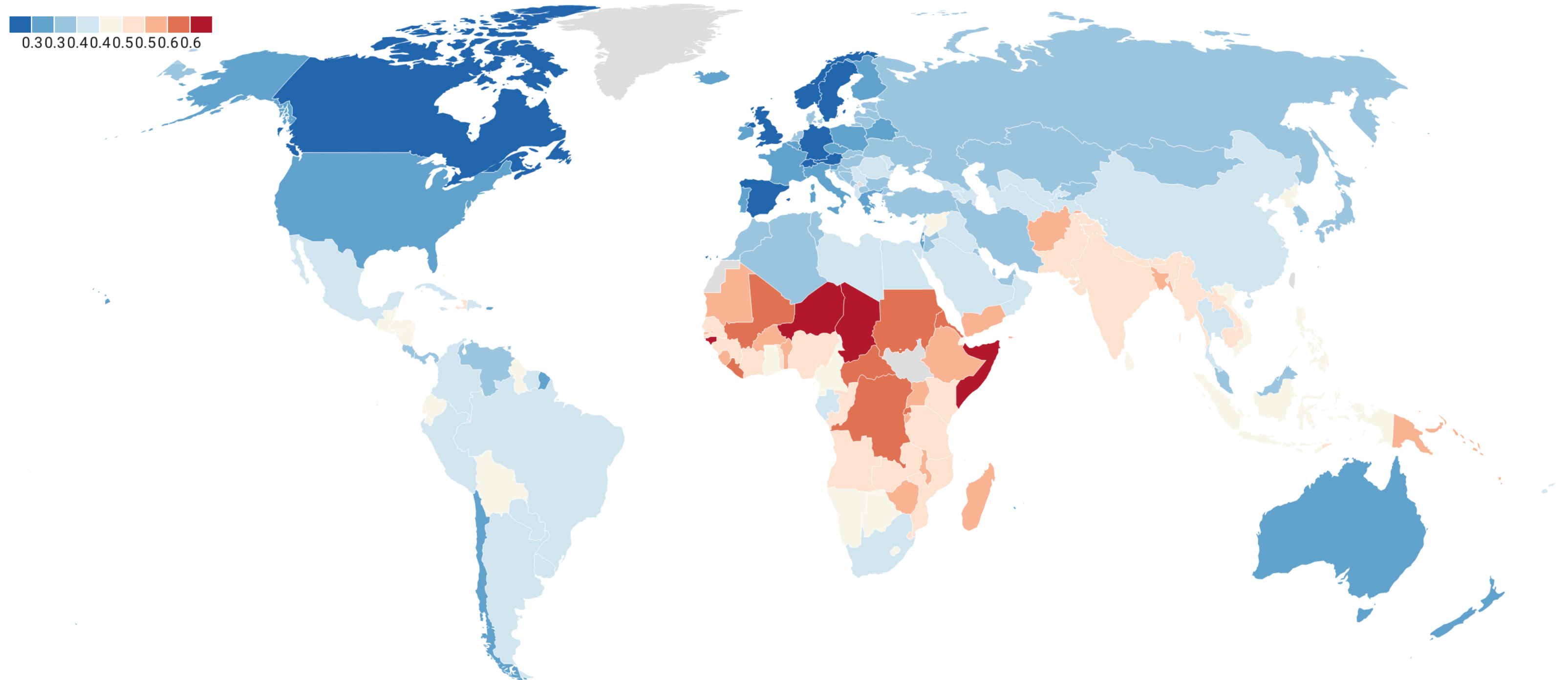
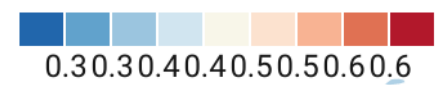
Vulnerability at the national level varies. Vulnerability also greatly differs within countries. Countries with moderate or low average vulnerability have sub-populations with high vulnerability and vice versa.



Examples of vulnerable local groups across different contexts include the following:

- Indigenous Peoples of the Arctic** | health inequality, limited access to subsistence resources and culture | CCP 6.2.3, CCP 6.3.1
- Urban ethnic minorities** | structural inequality, marginalisation, exclusion from planning processes | 14.5.9, 14.5.5, 6.3.6
- Smallholder coffee producers** | limited market access & stability, single crop dependency, limited institutional support | 5.4.2
- Indigenous Peoples in the Amazon** | land degradation, deforestation, poverty, lack of support | 8.2.1, Box 8.6
- Older people, especially those poor & socially isolated** | health issues, disability, limited access to support | 8.2.1, 13.7.1, 6.2.3, 7.1.7
- Island communities** | limited land, population growth and coastal ecosystem degradation | 15.3.2
- Children in rural low-income communities** | food insecurity, sensitivity to undernutrition and disease | 5.12.3
- People uprooted by conflict in the Near East and Sahel** | prolonged temporary status, limited mobility | Box 8.1, Box 8.4
- Women & non-binary** | limited access to & control over resources, e.g. water, land, credit | Box 9.1, CCB-GENDER, 4.8.3, 5.4.2, 10.3.3
- Migrants** | informal status, limited access to health services & shelter, exclusion from decision-making processes | 6.3.6, Box 10.2
- Aboriginal and Torres Strait Islander Peoples** | poverty, food & housing insecurity, dislocation from community | 11.4.1
- People living in informal settlements** | poverty, limited basic services & often located in areas with high exposure to climate hazards | 6.2.3, Box 9.1, 9.9, 10.4.6, 12.3.2, 12.3.5, 15.3.4

## Climate vulnerability

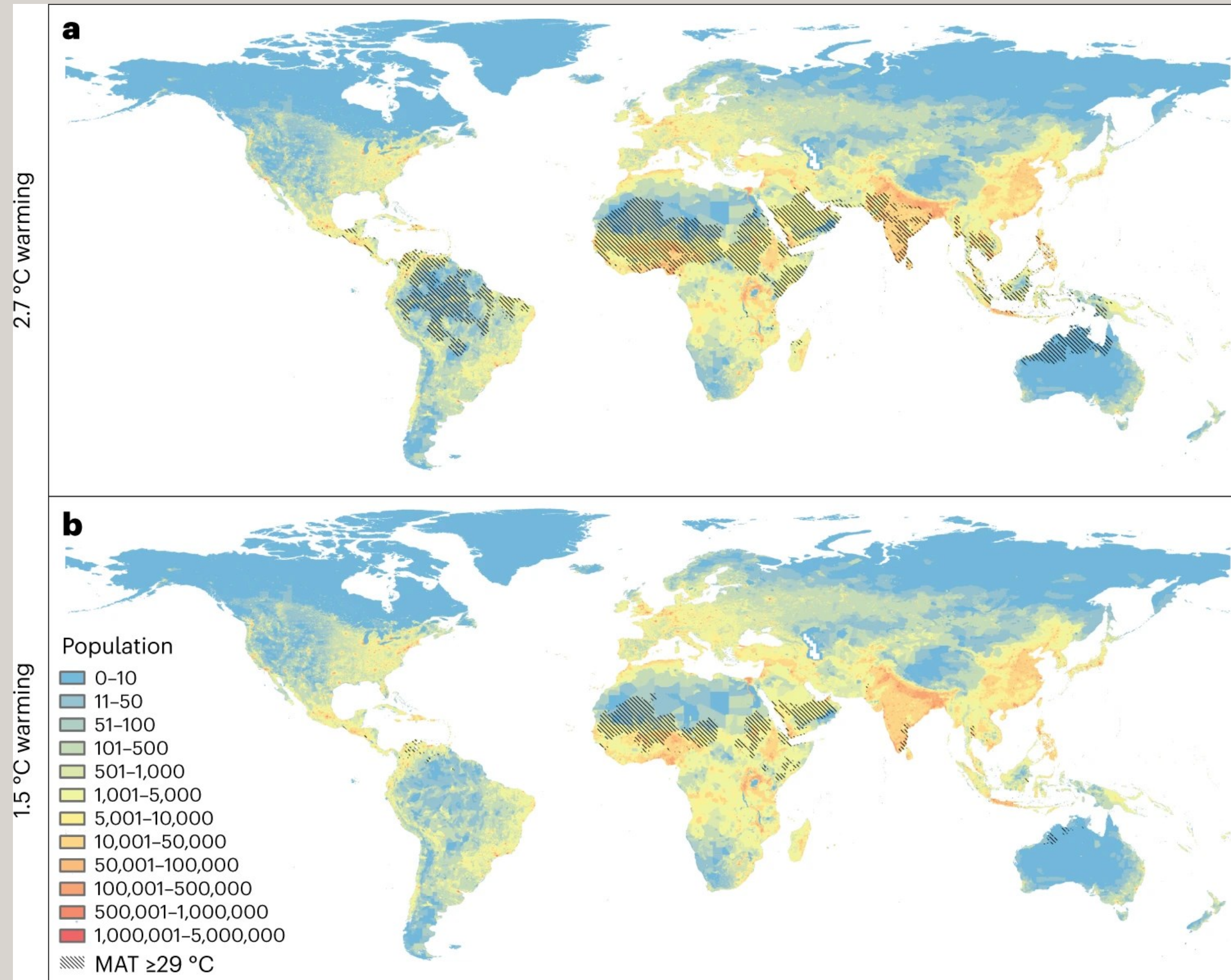


*Vulnerability measures a country's exposure, sensitivity and ability to adapt to the negative impact of climate change. ND-GAIN measures the overall vulnerability by considering vulnerability in six life-supporting sectors – food, water, health, ecosystem service, human habitat and infrastructure.*

Source: ND-Gain • Created with Datawrapper

<https://gain.nd.edu/our-work/country-index/rankings/>





# UNEQUAL RESPONSIBILITY AND MITIGATION OBLIGATIONS

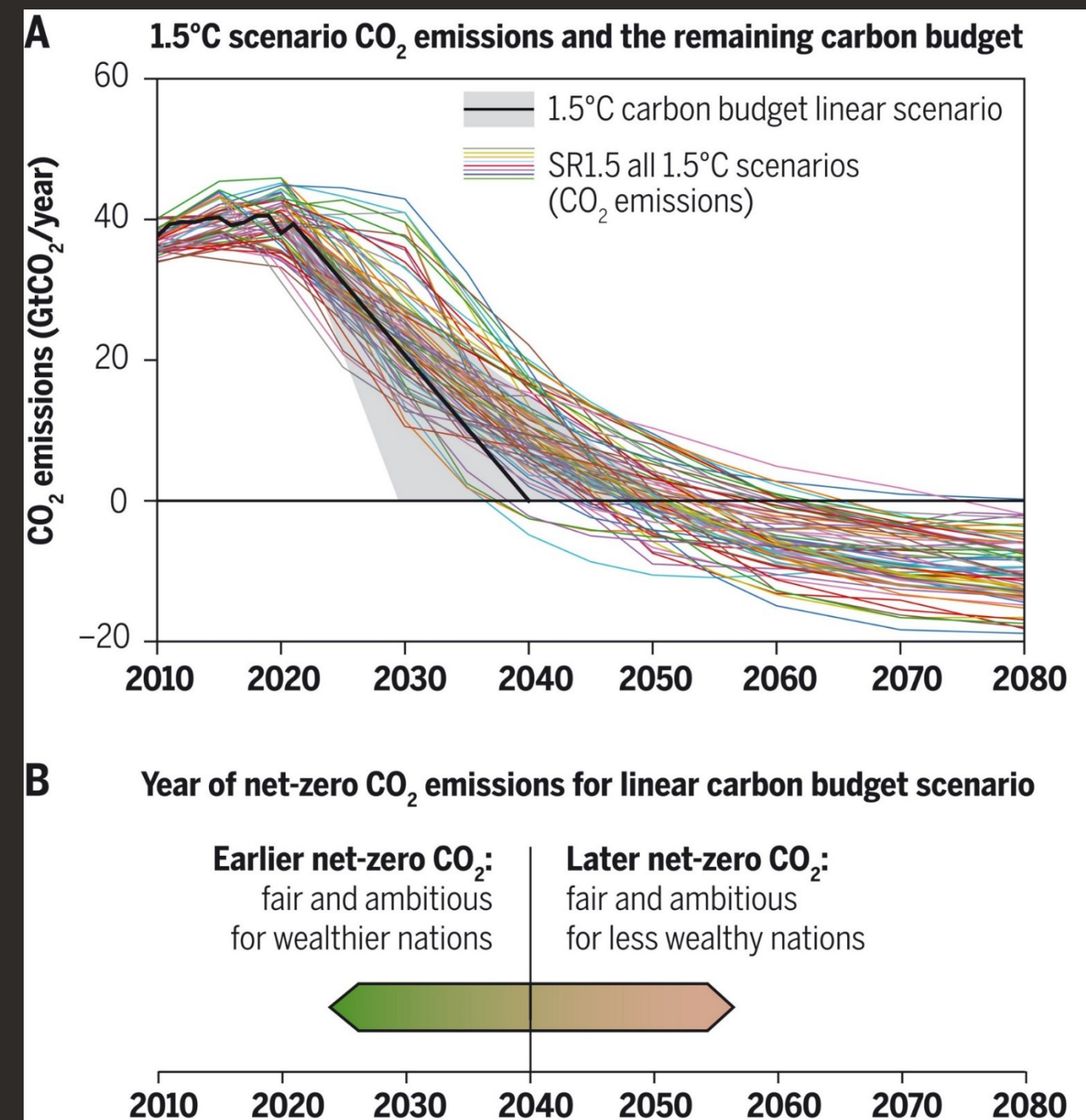
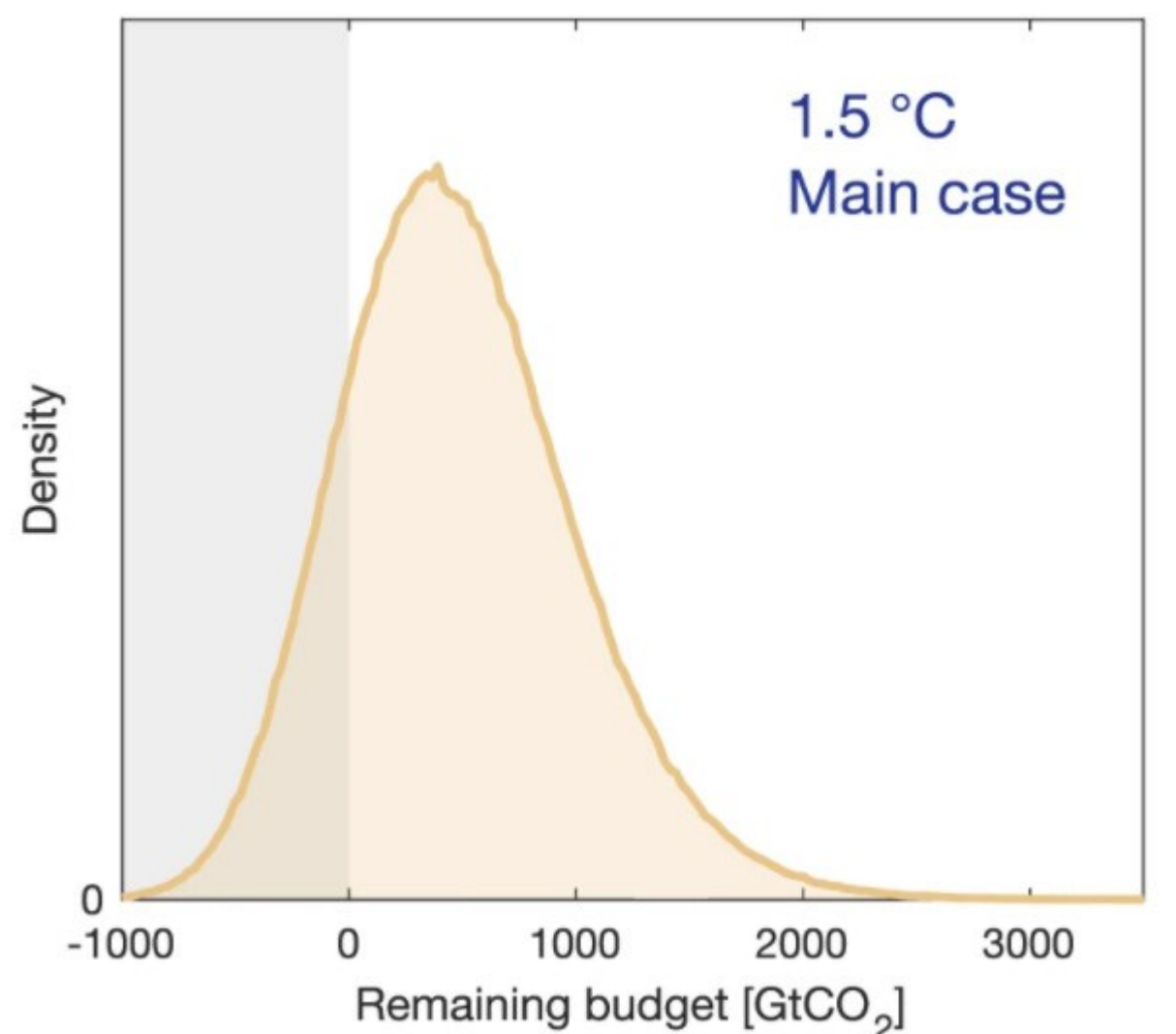
# REVIEW

## CLIMATE CHANGE

# The human imperative of stabilizing global climate change at 1.5°C

O. Hoegh-Guldberg<sup>1,2\*</sup>, D. Jacob<sup>3</sup>, M. Taylor<sup>4</sup>, T. Guillén Bolaños<sup>3</sup>, M. Bindi<sup>5</sup>, S. Brown<sup>6,7</sup>, I. A. Camilloni<sup>8</sup>, A. Diedhiou<sup>9</sup>, R. Djalante<sup>10,11</sup>, K. Ebi<sup>12</sup>, F. Engelbrecht<sup>13</sup>, J. Guiot<sup>14</sup>, Y. Hijioka<sup>15</sup>, S. Mehrotra<sup>16</sup>, C. W. Hope<sup>17</sup>, A. J. Payne<sup>18</sup>, H.-O. Pörtner<sup>19</sup>, S. I. Seneviratne<sup>20</sup>, A. Thomas<sup>21,22</sup>, R. Warren<sup>23</sup>, G. Zhou<sup>24</sup>

Increased concentrations of surface temperature 1.0°C in recent IPCC Special Report associated with higher level geographies, climates, and e be required to maintain subs for human health and econo particularly in low- and midc risks may prevent the achiev





# Distributive climate justice

- One dimension (procedural, recognition, intergenerational)
- Equitable burden sharing
  - Resource sharing
  - Effort sharing
- Assessing Danish climate targets in light of distributive justice

Climatic Change (2023) 176:103  
<https://doi.org/10.1007/s10584-023-03583-4>



## Green frontrunner or indebted culprit? Assessing Denmark's climate targets in light of fair contributions under the Paris Agreement

Joachim Peter Tilsted<sup>1</sup> · Anders Bjørn<sup>2</sup>

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### Abstract

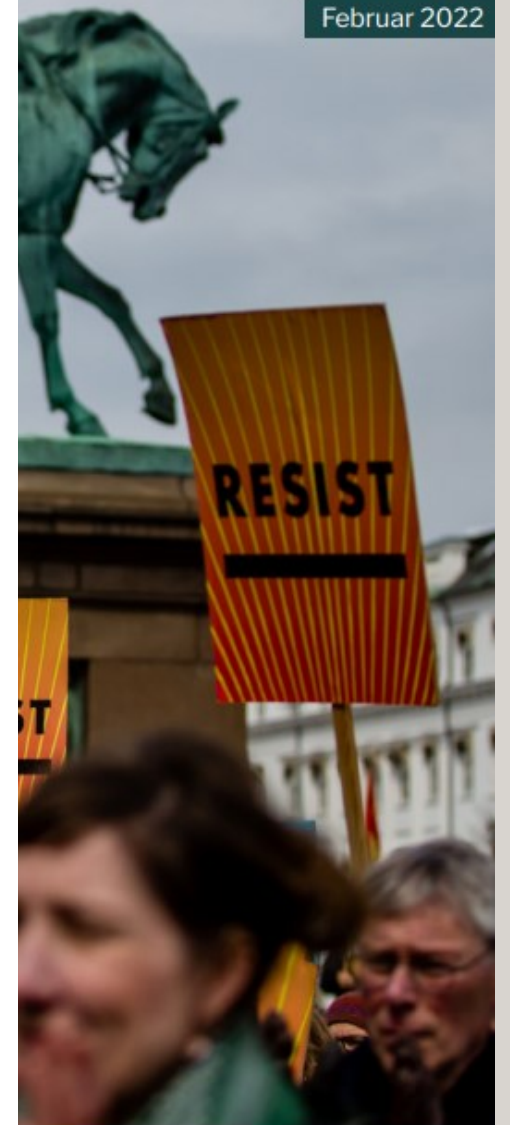
This paper contributes to academic and policy debates about climate leadership by illustrating an approach to examining national emission reduction targets focusing on Denmark. Widely recognized as a climate leader, Denmark is cherished for both its historical track record and its current climate targets. With a target of 70% emissions reduction by 2030 compared to 1990 stipulated in national law, central actors in Danish policymaking claim that domestic climate policy is aligned with the Paris temperature goals and present Denmark as a 'green frontrunner.' We examine the pledges and targets enshrined in the Danish Climate Act in reference to a 1.5 °C global greenhouse gas budget using five different approaches to burden sharing. For all five approaches, we find that the Danish climate target is inadequate given the 1.5 °C goal. Moreover, when only looking at equity approaches for distributive climate justice globally, the Danish target appears drastically insufficient. Denmark is, in this sense, not a green frontrunner but rather an indebted culprit, challenging the dominant narrative in Danish climate policy. Our results thus call into question the premise of the claim of Danish climate leadership, which works to legitimize existing policy and obscure the many dimensions of climate change.

**Keywords** Nationally determined contributions · Denmark · Burden sharing · Paris Agreement · Emission budgets · Distributive justice

Er 70% retfærdigt?

Danmarks klimamål i lyset af global retfærdighed

Februar 2022

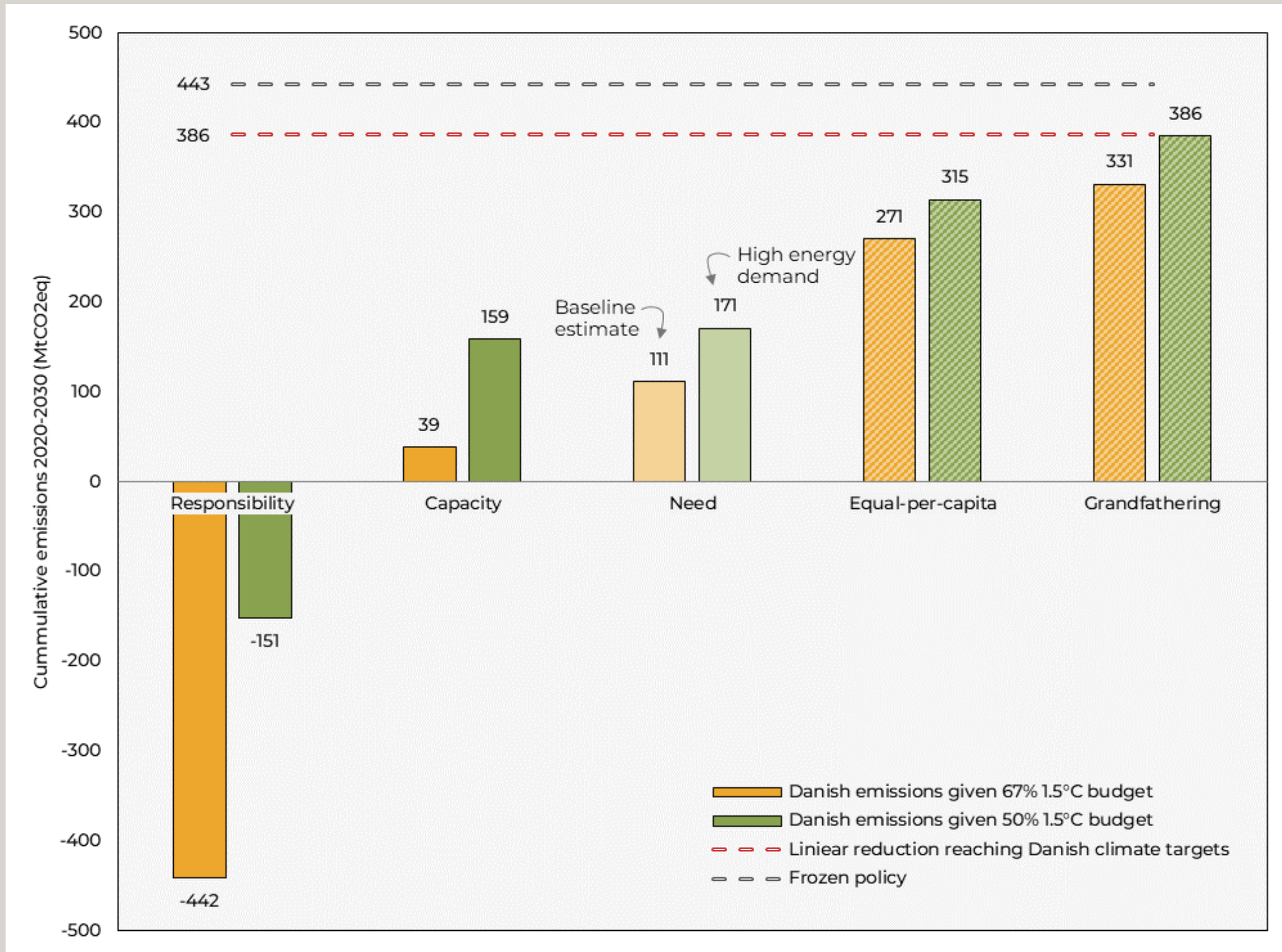


# Distributive climate justice

- Responsibility
- Capacity
- Equity
  - Needs
  - Equal per capita
- Grandfathering
- Our position: Actors in equal positions carry equal obligations (Dooley et al., 2021)





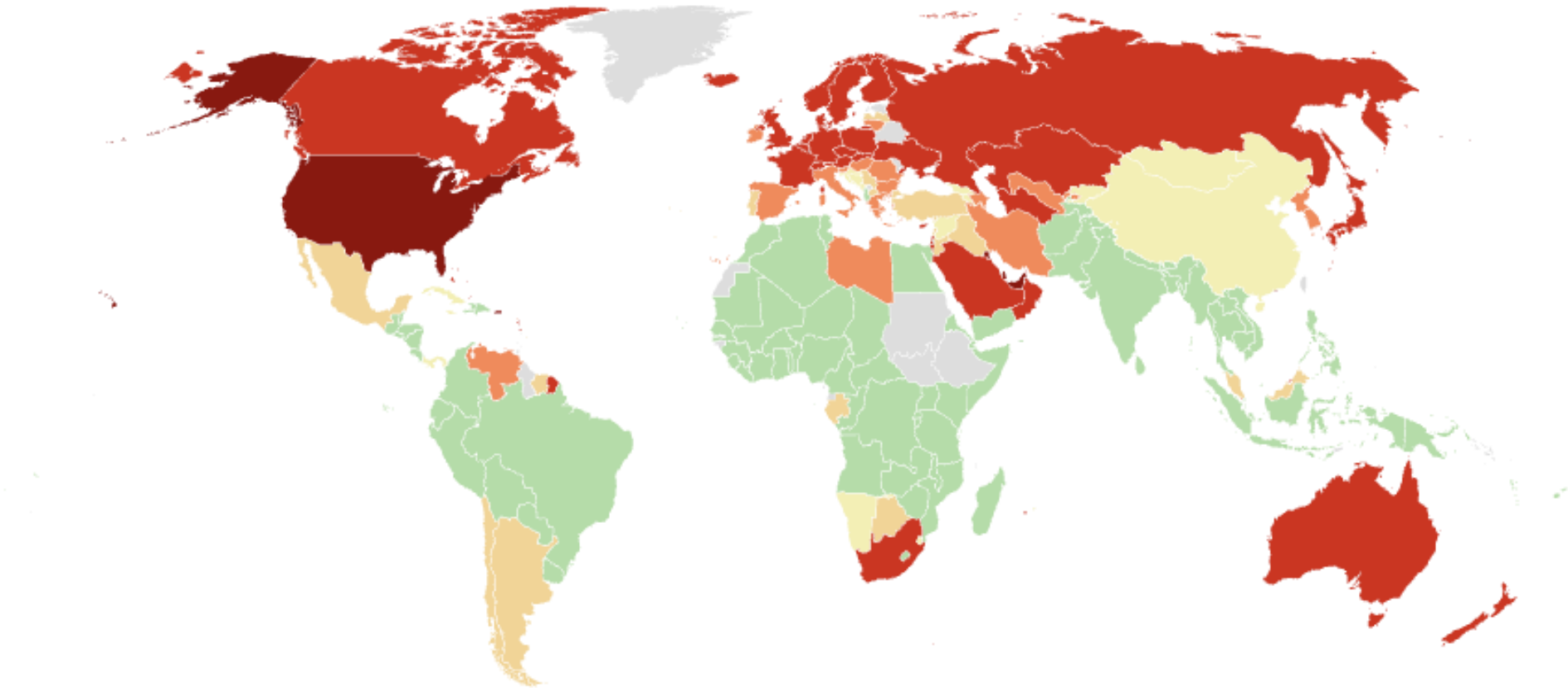


# Responsibility for climate breakdown

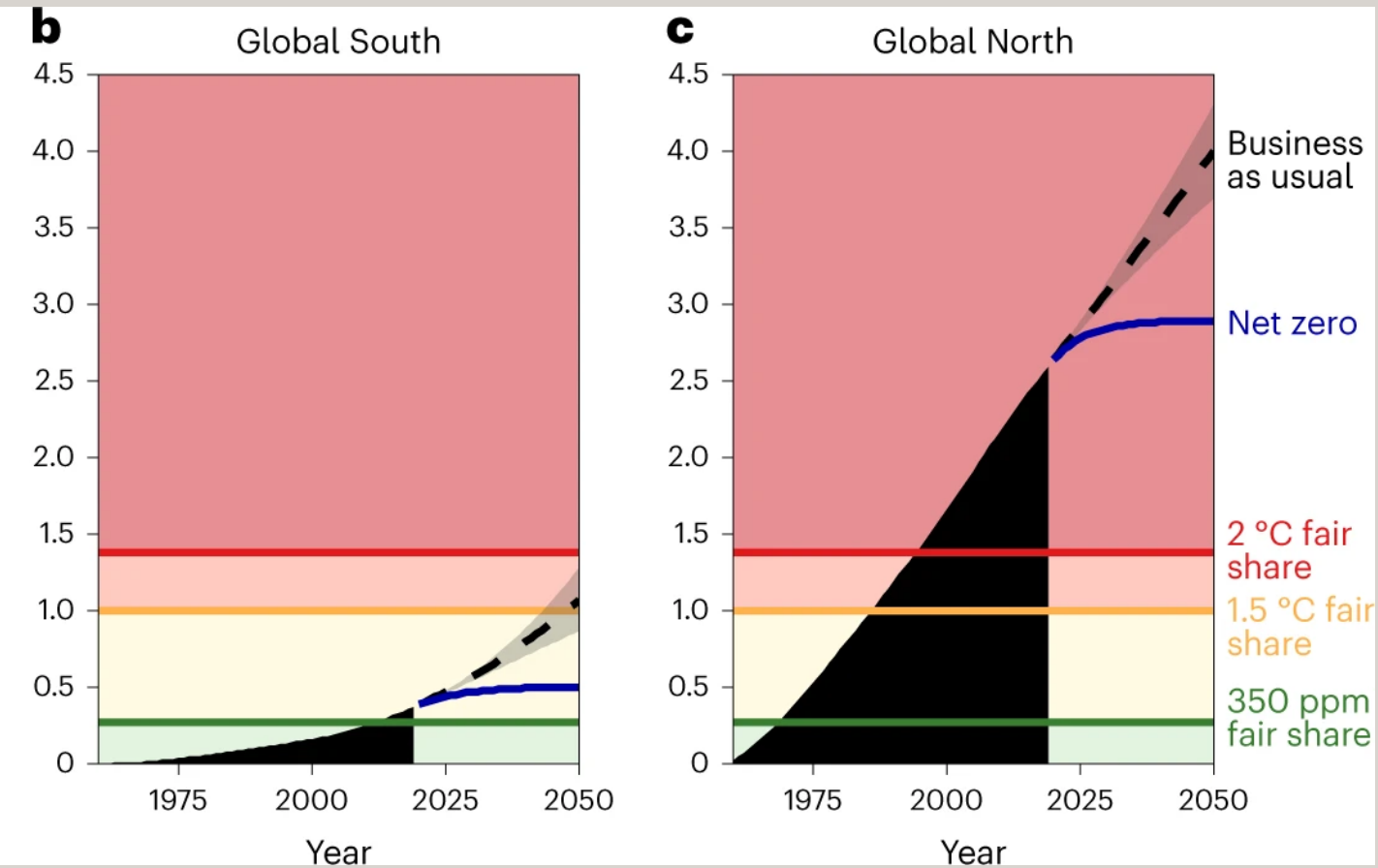
National cumulative CO2 emissions in excess of fair-shares of the planetary boundary (350ppm)

Overshoot ratio: cumulative emissions as multiple of safe fair-share

No overshoot 1-1.5x 1.5-2x 2-3x 3-10x >10x



Based on cumulative CO2 emissions from 1850-2019. Countries in green were still within their fair share of the 350ppm boundary as of 2019.





# Stemmer Danmarks nationale klimamål overens med Parisaftalens temperaturmål?

|                                   |                                                   | Grad af sikkerhed for at opfylde målet | Globalt temperaturmål |                          |                          |
|-----------------------------------|---------------------------------------------------|----------------------------------------|-----------------------|--------------------------|--------------------------|
|                                   |                                                   |                                        | 1,5 grader            | 1,5 grader med overshoot | Et stykke under 2 grader |
| Etisk princip for Danmarks ansvar | Samme udledninger pr. indbygger                   | 50 pct.                                | Nej                   | Ja                       | Ja                       |
|                                   |                                                   | 67 pct.                                | Nej                   | Nej*                     | Nej*                     |
|                                   | Udledninger fordeles på lande ud fra "fair share" | 50 pct.                                | Nej                   | Nej                      | Nej                      |
|                                   |                                                   | 67 pct.                                | Nej                   | Nej                      | Nej                      |

Anm. 1: 1,5 grader er defineret som maksimal temperaturstigning på 1,5 grader i alle år frem til 2100. 1,5 grader med overshoot er defineret som maksimal temperaturstigning på 1,5 grader i 2100, men derefter stigningen overstiger 1,5 grader. Et stykke under 2 grader er defineret som maksimal temperaturstigning på 1,5 grader i alle år frem til 2100.

Anm. 2: Nej\* indikerer, at overskridelsen er beskeden i forhold til de grænser, der er defineret i Parisaftalen.

Anm. 3: Fair share baseres i tabellen på et studie af Rajamani mfl. (2021). I studiet estimerer studiet alle landes rimelige andel af verdens udledninger af drivhusgasser. Danmarks andel er så lille, at vores nuværende klimamål er i overensstemmelse med fair share.

Kilde: Klimarådet.

|                                                                                       |                          |                                                                                        |
|---------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------|
|  | Forbrugsudledninger      | Udledninger forbundet med danskernes forbrug, herunder forbrug af biomasse.            |
|  | Rådgivning og bistand    | Udledninger, som Danmark kan bidrage til at reducere via fx myndighedssamarbejde.      |
|  | Bruttonationalprodukt    | Udledninger forbundet med at skabe dansk BNP, herunder dansk eksport.                  |
|  | International transport  | Udledninger forbundet med den danske andel af international transport.                 |
|  | Territoriale udledninger | Udledninger, der sker på dansk territorium som defineret ud fra FN's opgørelsesmetode. |

Figur 1 Forskellige udledninger og fokusområder, som dansk klimapolitik kan rettes imod

Kilde: Klimarådet.





# INEQUALITY ALONG DIFFERENT DIMENSIONS

## PERSPECTIVE

<https://doi.org/10.1038/s41467-020-16941-y>

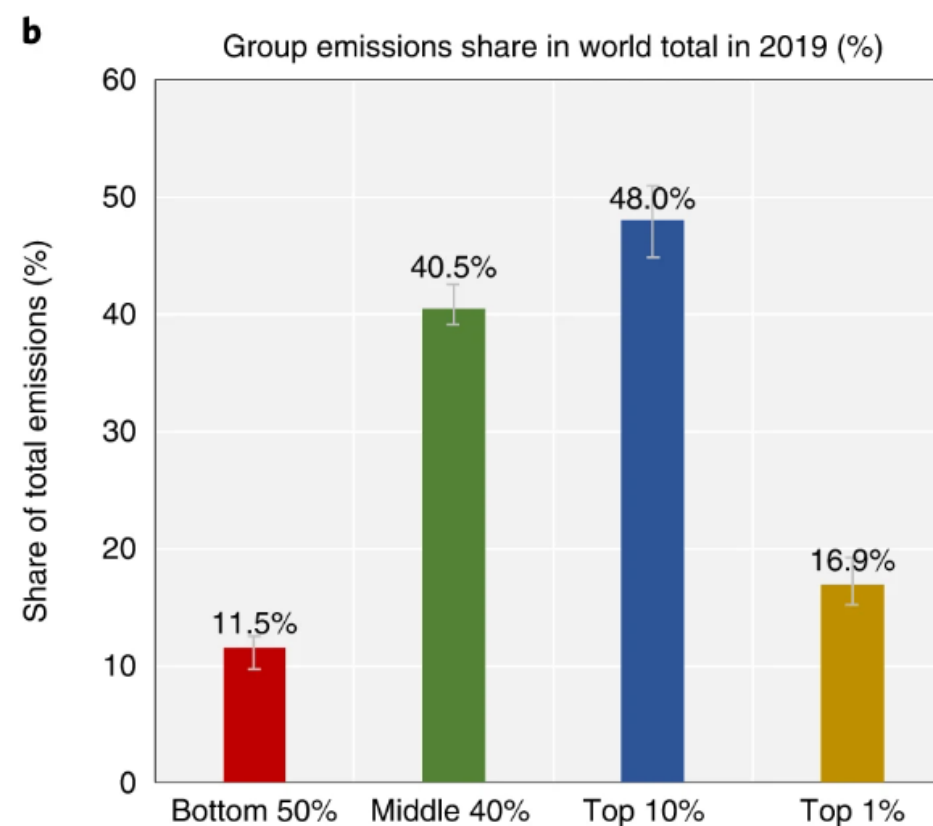
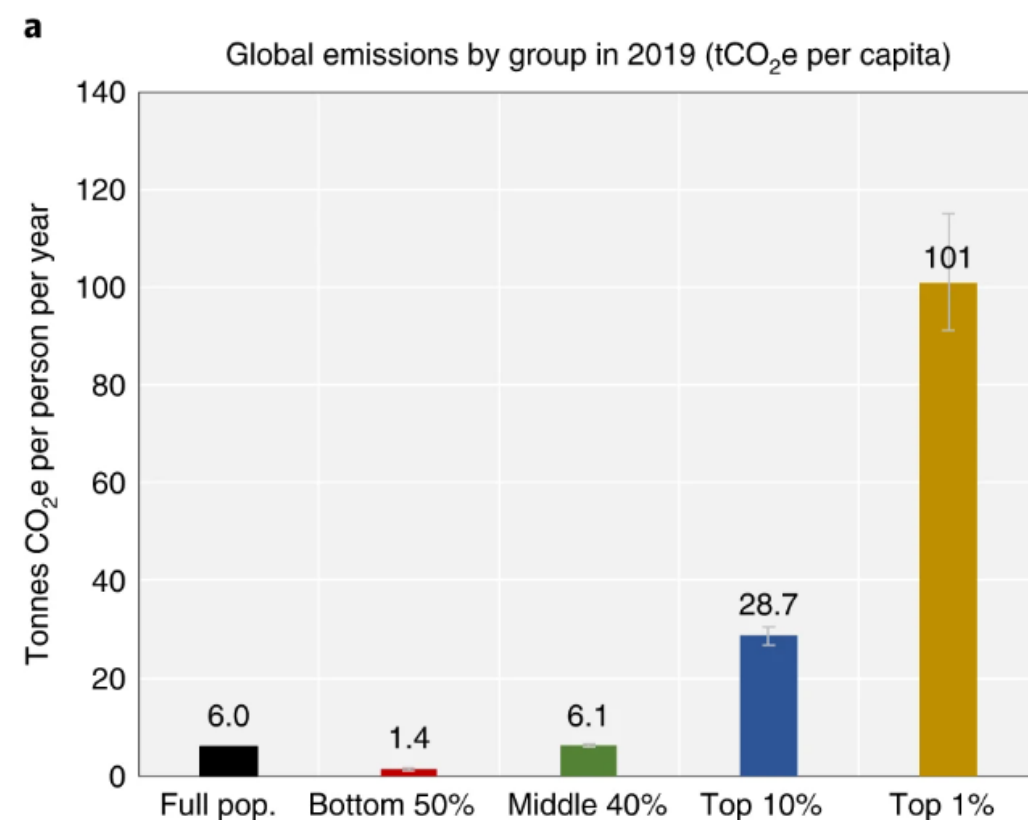
OPEN

# Scientists' warning on affluence

Thomas Wiedmann <sup>1</sup>✉, Manfred Lenzen <sup>2</sup>, Lorenz T. Keyßer <sup>3</sup> & Julia K. Steinberger <sup>4</sup>

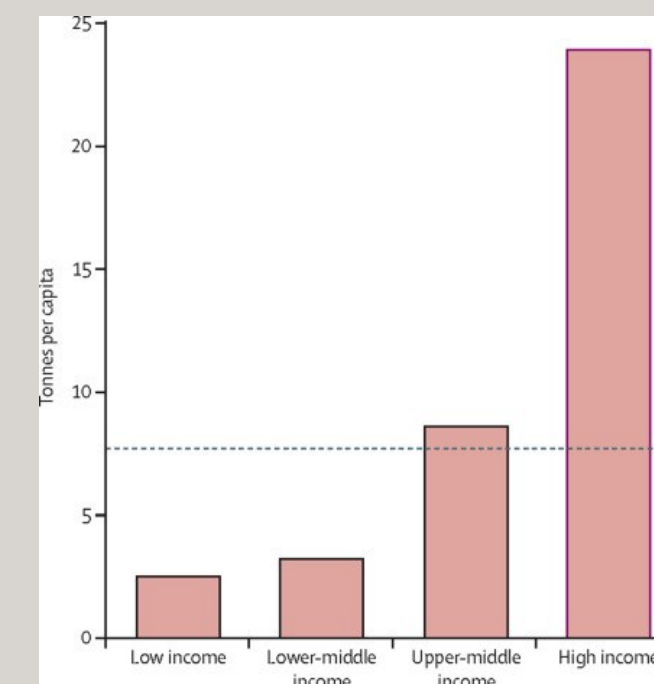
For over half a century, worldwide growth in affluence has continuously increased resource use and pollutant emissions far more rapidly than these have been reduced through better technology. The affluent citizens of the world are and are central to any future prospect of retreating to safer environmental conditions. We summarise the evidence and present possible solution approaches. Any transition towards sustainability can only be effective if far-reaching changes in consumption patterns and economic advancements. However, existing societies, economic growth and the structural imperative for growth in competitive market economies inhibits necessary societal change.

**“Highly affluent consumers drive biophysical resource use (a) directly through high consumption, (b) as members of powerful factions of the capitalist class and (c) through driving consumption norms across the population”**



**c** Global emissions inequality in 2019: summary table

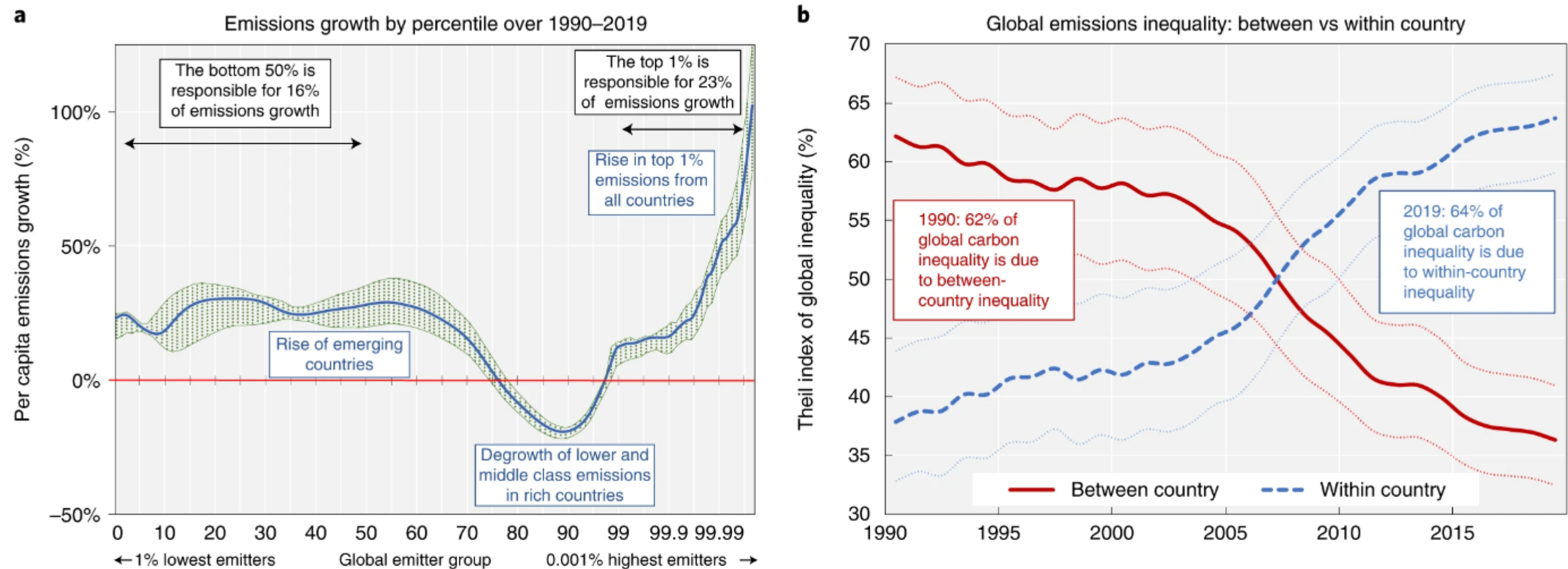
|                  | Number of individuals (million) | Average (tonnes CO <sub>2</sub> per capita) | Threshold (tonnes CO <sub>2</sub> per capita) | Share (% total) |
|------------------|---------------------------------|---------------------------------------------|-----------------------------------------------|-----------------|
| Full population  | 7,710                           | 6                                           | <0.1                                          | 100%            |
| Bottom 50%       | 3,855                           | 1.4                                         | <0.1                                          | 11.5%           |
| incl. bottom 20% | 1,542                           | 0.7                                         | <0.1                                          | 2.3%            |
| incl. next 30%   | 2,315                           | 1.8                                         | 1.1                                           | 9.2%            |
| Middle 40%       | 3,084                           | 6                                           | 2.8                                           | 40.5%           |
| Top 10%          | 771                             | 29                                          | 13                                            | 48%             |
| incl. top 1%     | 77.1                            | 101                                         | 47                                            | 16.9%           |
| incl. top 0.1%   | 7.71                            | 425                                         | 125                                           | 7.1%            |
| incl. top 0.01%  | 0.771                           | 2,332                                       | 566                                           | 3.9%            |



Mean annual material use by country income group, 1970–2017, relative to the mean annual per capita boundary (7.7 tonnes per capita)

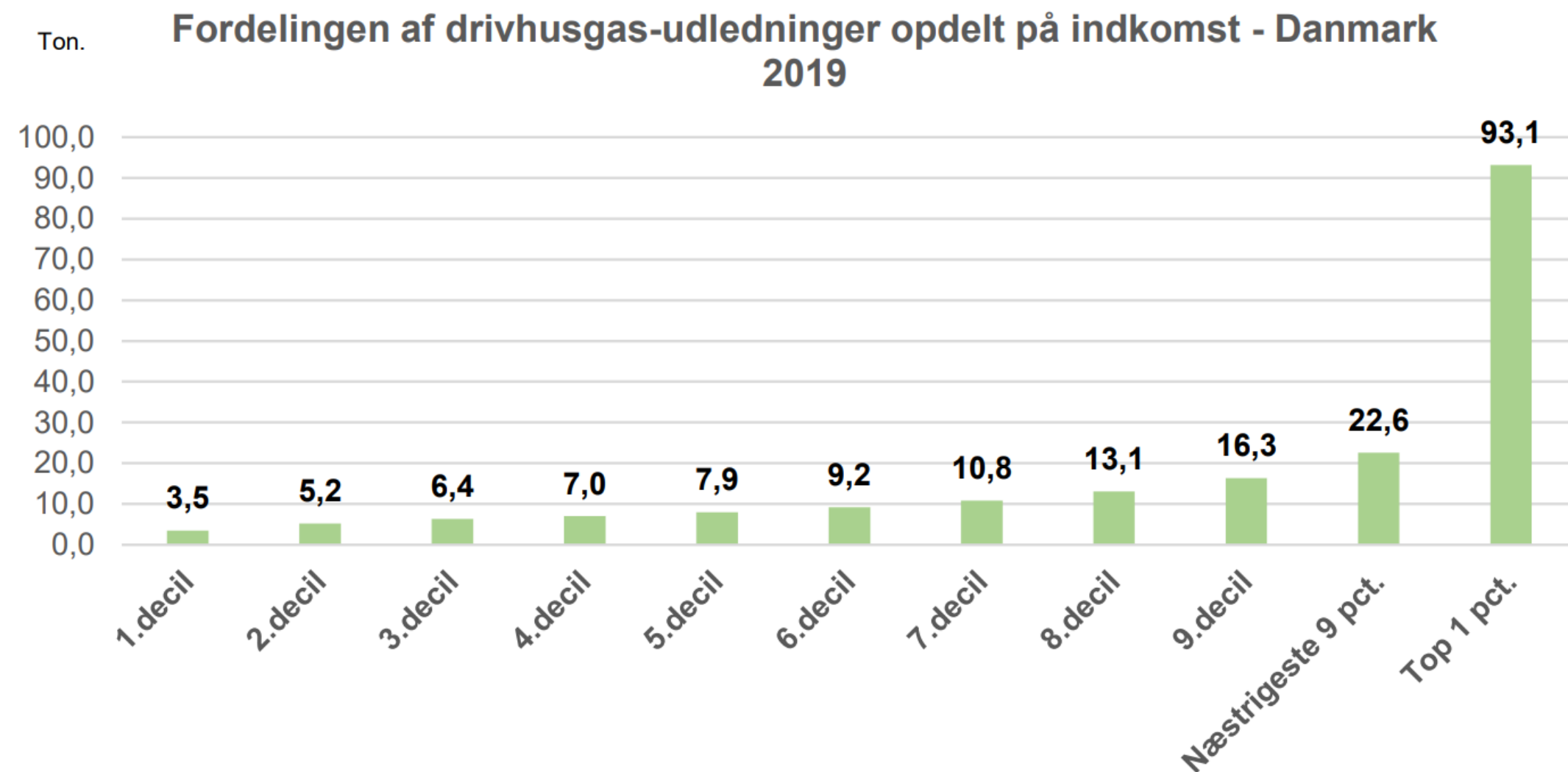
Lancet Planet Health 2020; 4: e399–404





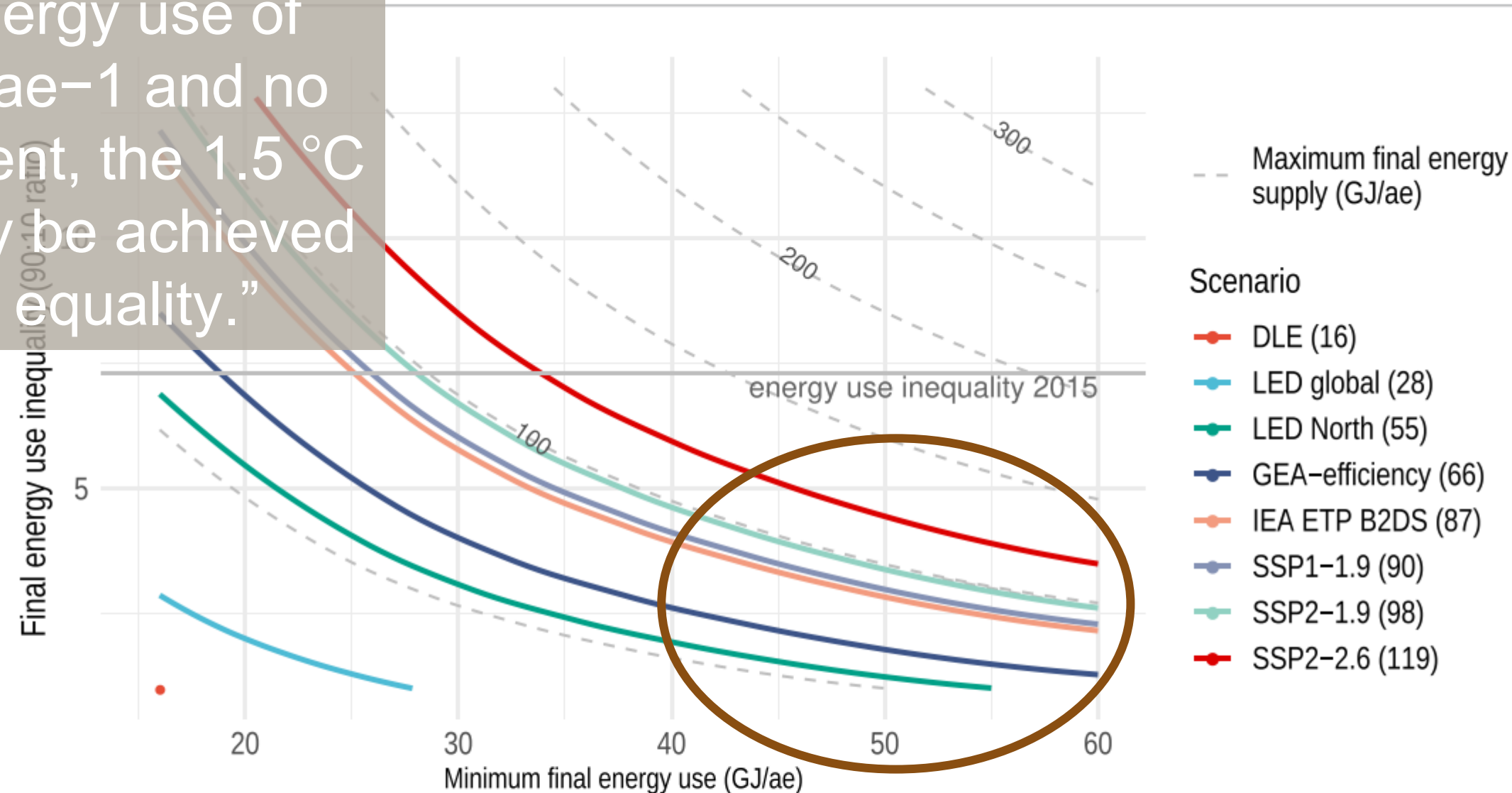
Personal carbon footprints include emissions from domestic consumption, public and private investments, as well as imports and exports of carbon embedded in goods and services traded with the rest of the world. Modelled estimates are based on the systematic combination of tax data, household surveys and input-output tables. Benchmark scenario. Emissions are split equally within households. **a**, Growth in emissions by global emitter group over 1990–2019. Dotted area represents upper and lower bounds from our range of extreme scenarios. **b**, Global emissions inequality between vs within countries. Dotted lines represent scenarios with  $\alpha = 0.4$  and  $\alpha = 0.8$ . Source and series: Author, see Methods and Supplementary Information sections [5–7](#).

# Also applies to Danish context



Kilde og anmærkning: Data fra World Inequality Database.

“Assuming a more realistic minimum energy use of about 55 GJ ae<sup>-1</sup> and no CCS deployment, the 1.5 °C target can only be achieved at near full equality.”

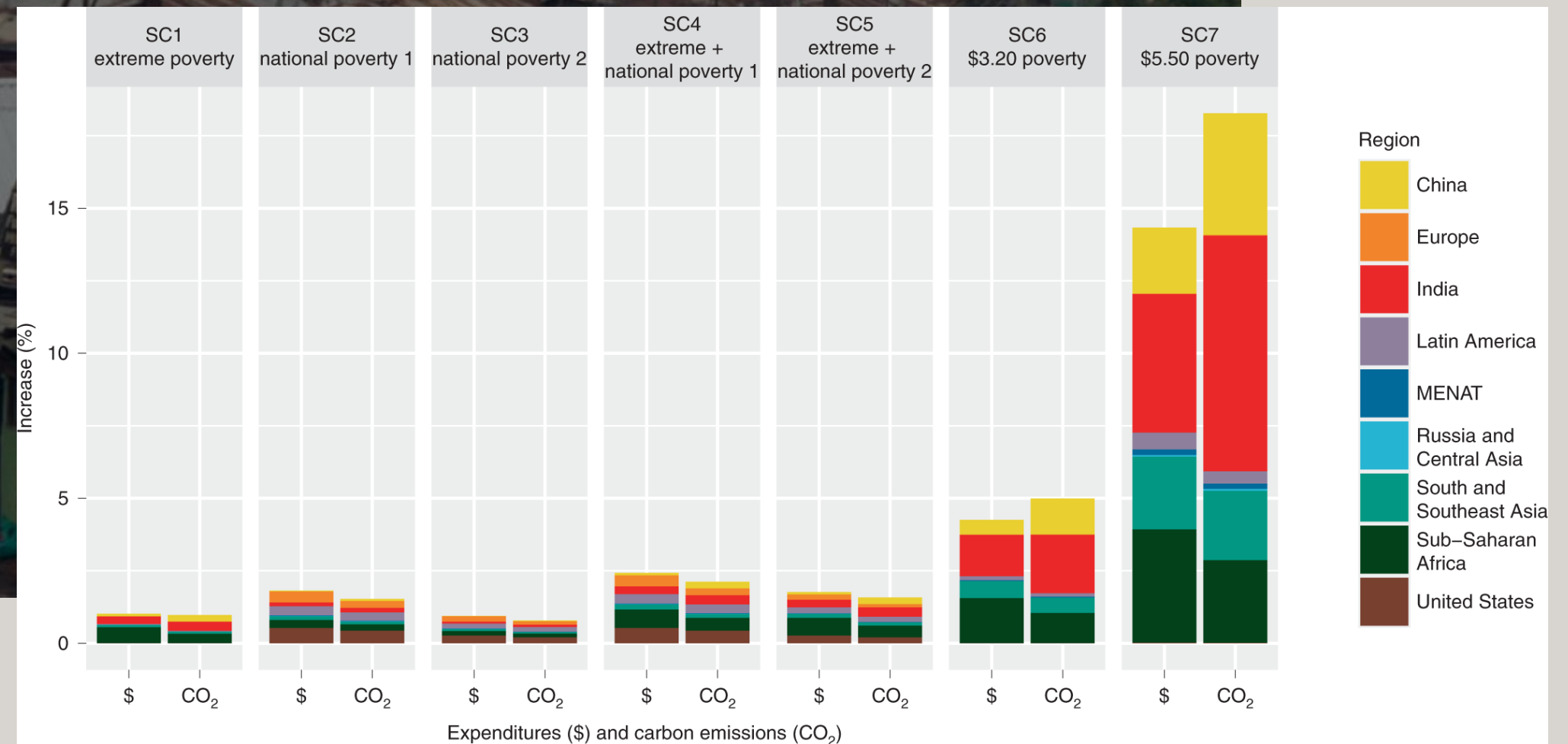


**Figure 5.** The maximum available average final energy supply (colored scenario lines and dashed elevation lines, in household GJ/adult equivalent) in the 1.5 °C compatible scenarios, and for comparison one 2 °C scenario (SSP2-2.6), together with the assumed minimum final energy use (household GJ/adult equivalent) for a decent life, determine the maximum level of final energy use inequality (expressed as 90:10 top-to-bottom decile ratio) while achieving both goals. Energy inequality was calculated for harmonized best technology per final consumption category.



PEOPLE | 14 February 2022 🕒 16:00

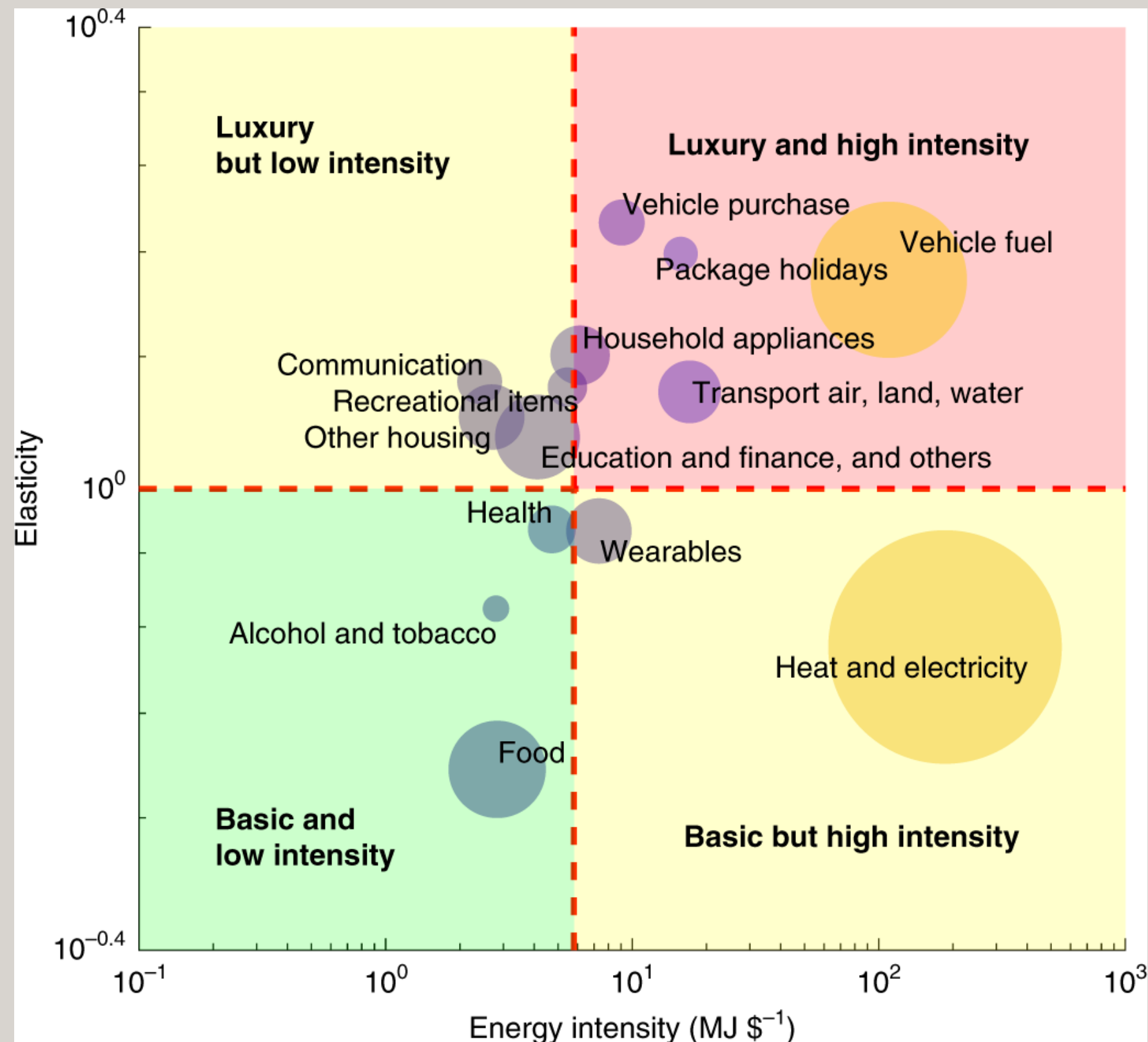
# Eradicating 'extreme poverty' would raise global emissions by less than 1%





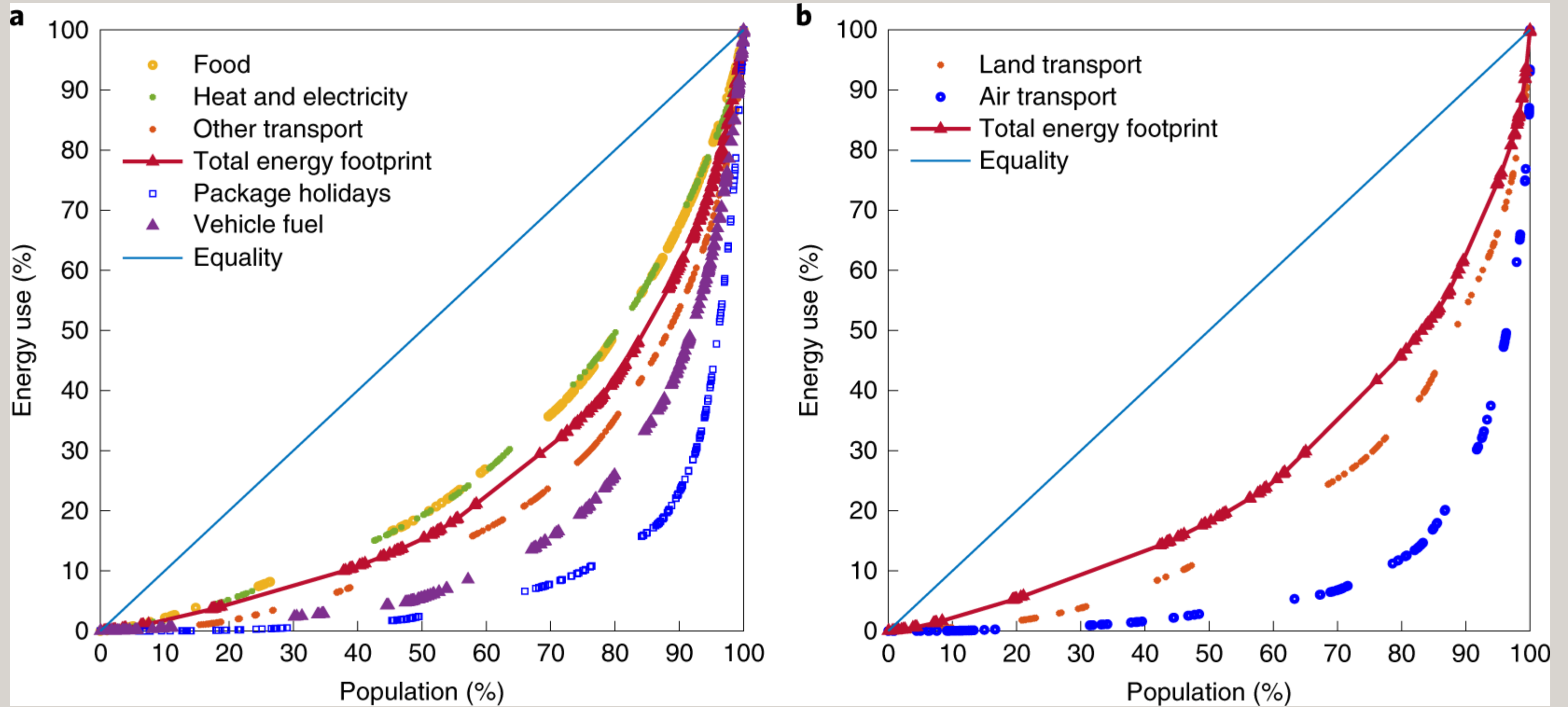
Changes more than income

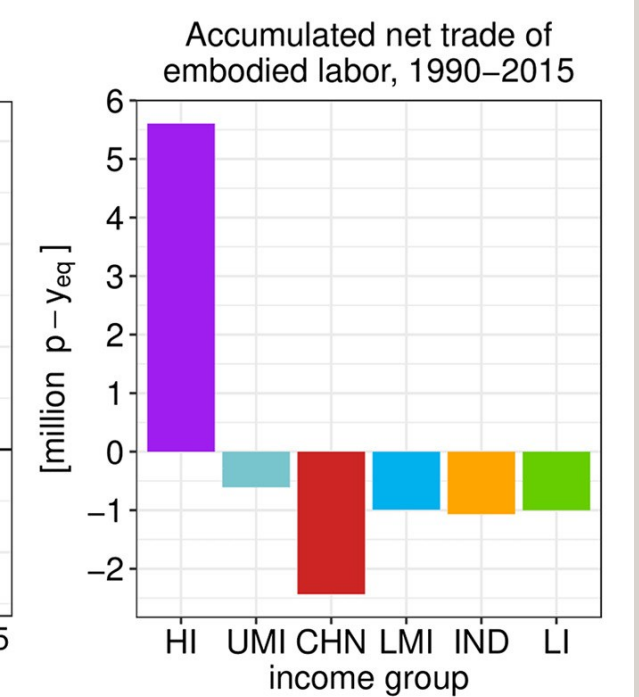
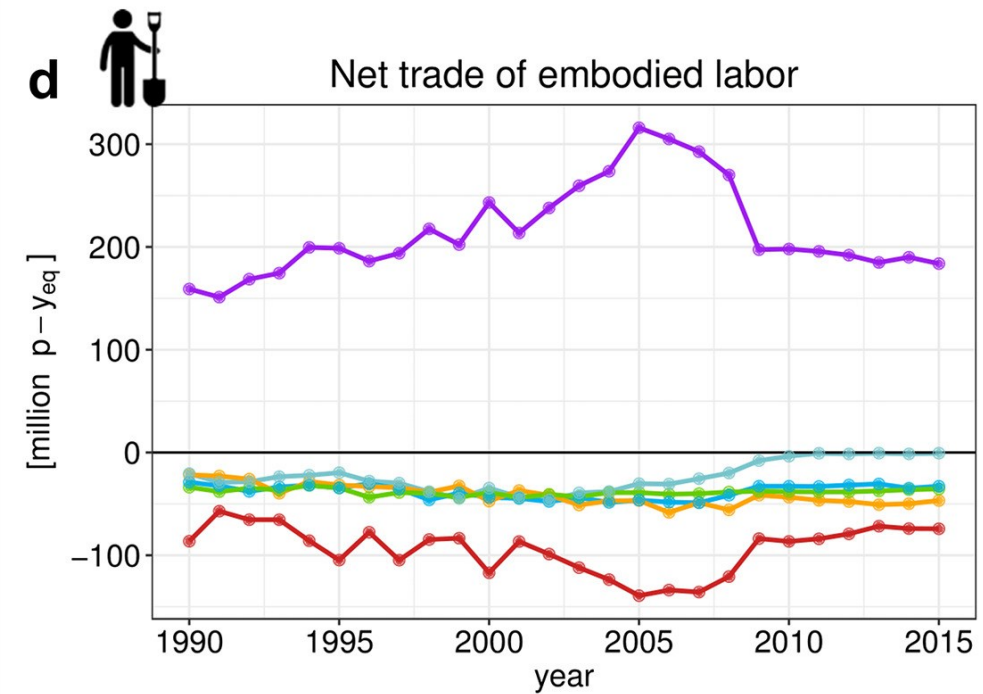
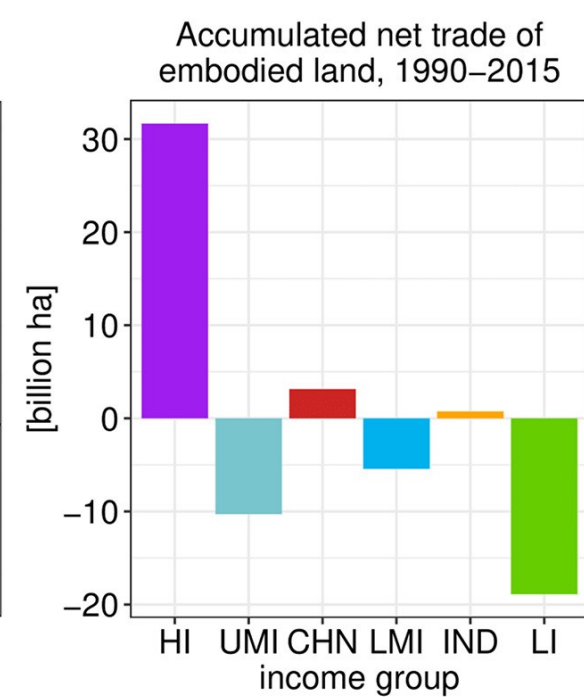
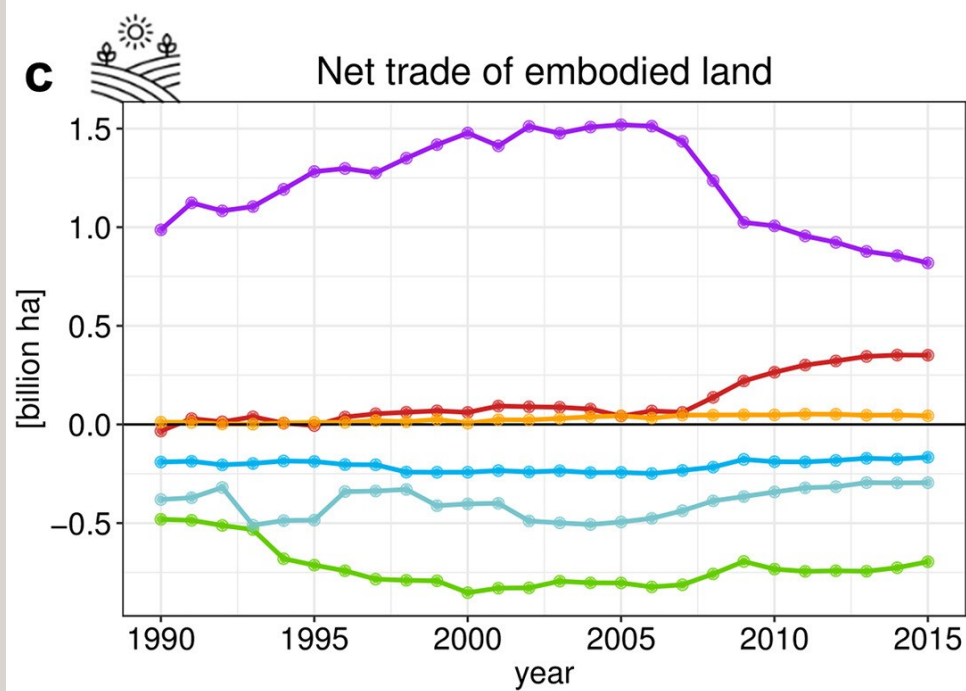
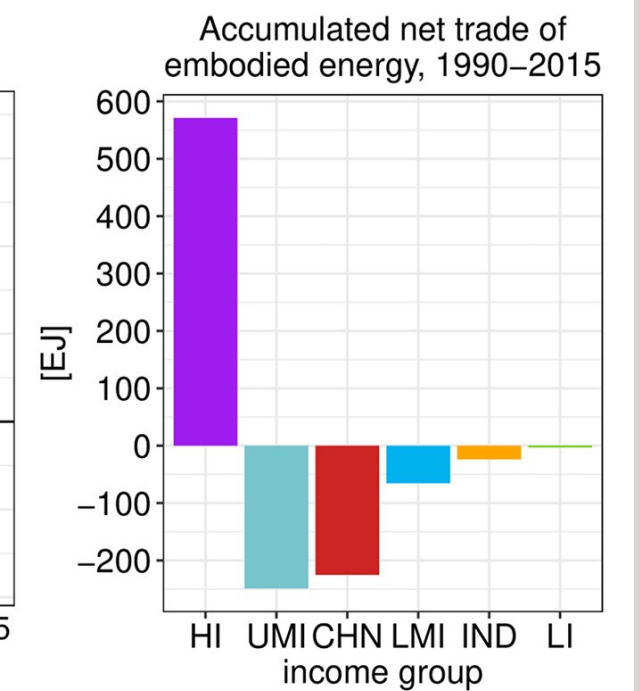
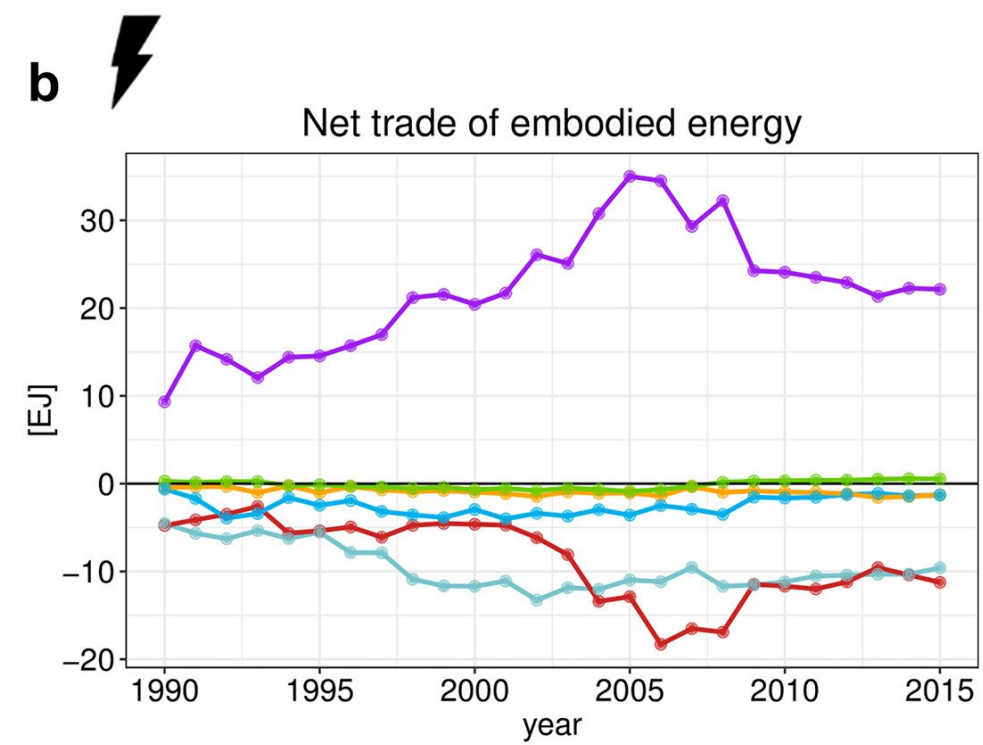
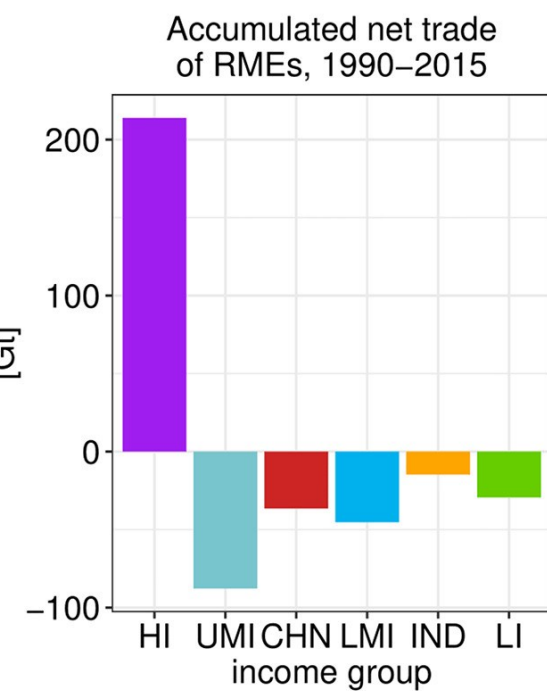
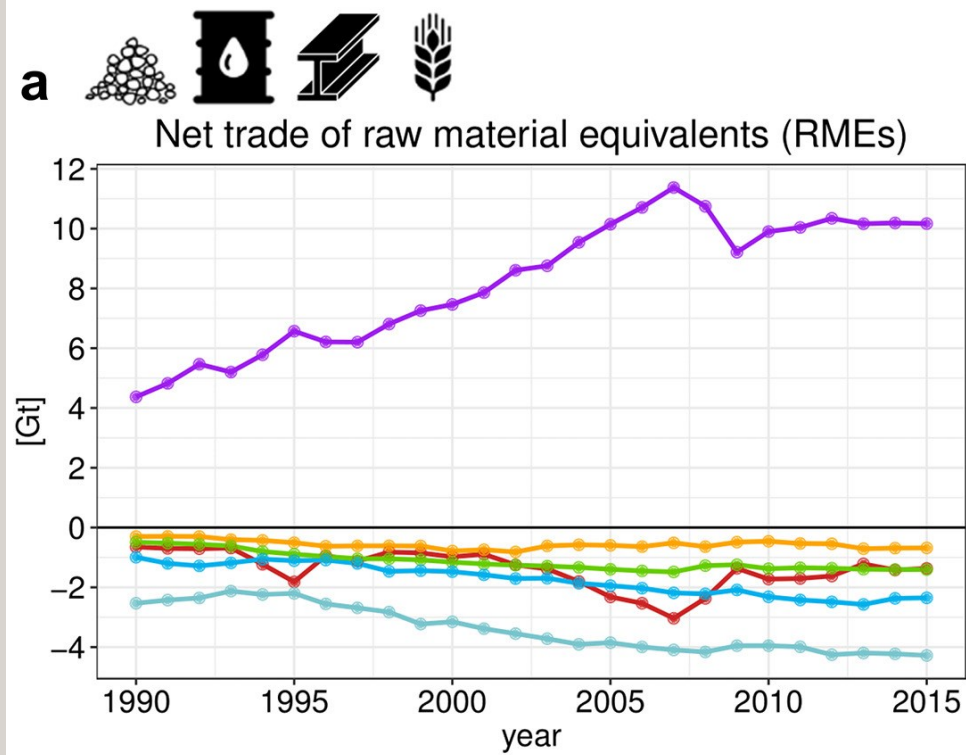
Changes less than income



Changes more than income

Changes less than income





# NOTES ON THE NOTION OF A JUST TRANSITION



|                                  |                   | What kind of climate policy?                                                                                                                                    |                                                                                                                   |                                                                                                                                                                                             |
|----------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                  |                   | Increase green energy supply                                                                                                                                    | Increase green energy access                                                                                      | Switch in energy end-uses (building, transport, industry)                                                                                                                                   |
| Which social group is targetted? | Bottom 50%        | Industrial policy: public investments in renewables (off or on-grid); Social protection: increase transfers to workers in industries affected by the transition | Public investments in green energy access (e.g. clean cookstoves; construction of new zero carbon social housing) | Develop public transport systems: low-carbon bus, rail, car-sharing strategies; energy retrofitting in social housing; cash-transfers to compensate increase in fossil energy prices        |
|                                  | Middle 40%        | Same as above + Financial incentives to encourage middle-class investments in green energy. Bans on new fossil investments                                      | Subsidies for green housing construction; Buildings regulations; penalty and bans on sales of inefficient housing | Same as above; Stricter regulations & taxes on polluting purchases (SUVs, air tickets); Subsidies on green alternatives (elec. vehicles)                                                    |
|                                  | Top 10 % & Top 1% | Wealth or corporate taxes with pollution top-up to finance the above & accelerate divestment from fossils; Bans on new fossil investments                       | Wealth or corporate taxes with pollution top-up (see left); Fossil fuel subsidy removal*                          | Strict regulations on polluting purchases (SUVs, air tickets); Wealth or corporate taxes with pollution top-up (see left); Carbon cards to track high personal carbon footprints & cap them |

Notes: The table presents a non-exhaustive list of different types of climate policies and of their potential impacts on social groups. \*Fossil fuel subsidies typically benefit wealthy groups more than poorer groups in rich and developing countries. See also SI section [8.2](#).

# The Yellow Vests

- Appeal to social justice as discourse of climate delay
- Yellow Vest movement a movement against inequality

Environmental Innovation and Societal Transitions 40 (2021) 382–394

Contents lists available at ScienceDirect

Environmental Innovation and Societal Transitions

journal homepage: [www.elsevier.com/locate/eist](http://www.elsevier.com/locate/eist)

A discourse analysis of yellow-vest resistance against carbon taxes

Rimel I. Mehleb<sup>a</sup>, Giorgos Kallis<sup>a,b,\*</sup>, Christos Zografos<sup>c</sup>

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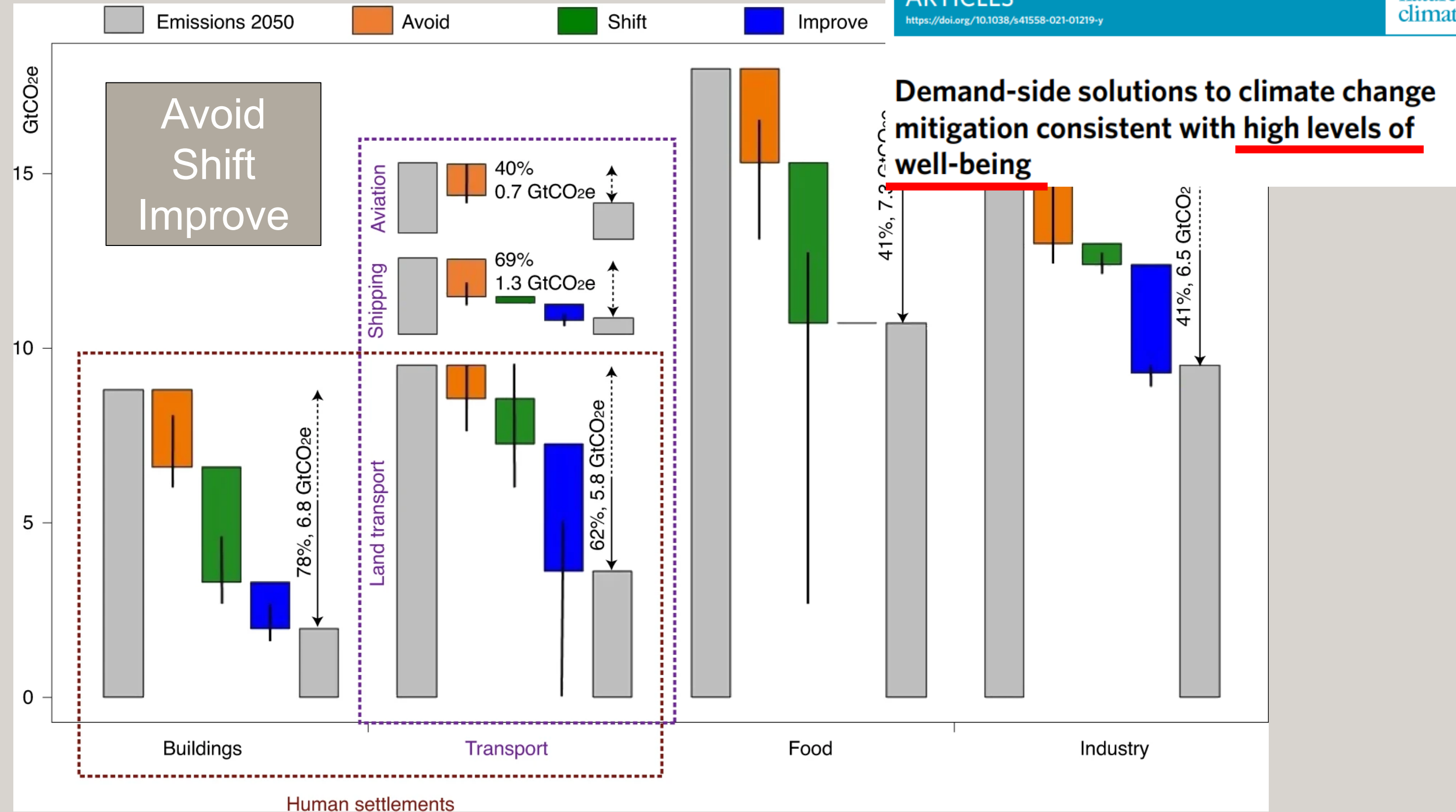
Keywords:  
Carbon tax  
Social movements  
Conflict  
Policy design  
Discourses

ABSTRACT

Highlights

- The Yellow Vest movement is not a denialist, anti-environmental movement.
- There are diverse opinions within the movement, some members concerned with climate change.
- Participants are not necessarily against carbon taxes; they are against the specific French tax.
- Carbon taxation requires participatory and equitable designs.





# Towards distributive justice

- Debt-for-climate swaps
- Loss and damage fund
- Unconditional finance
- Debt relief
- Equity-informed plans for net negative emissions







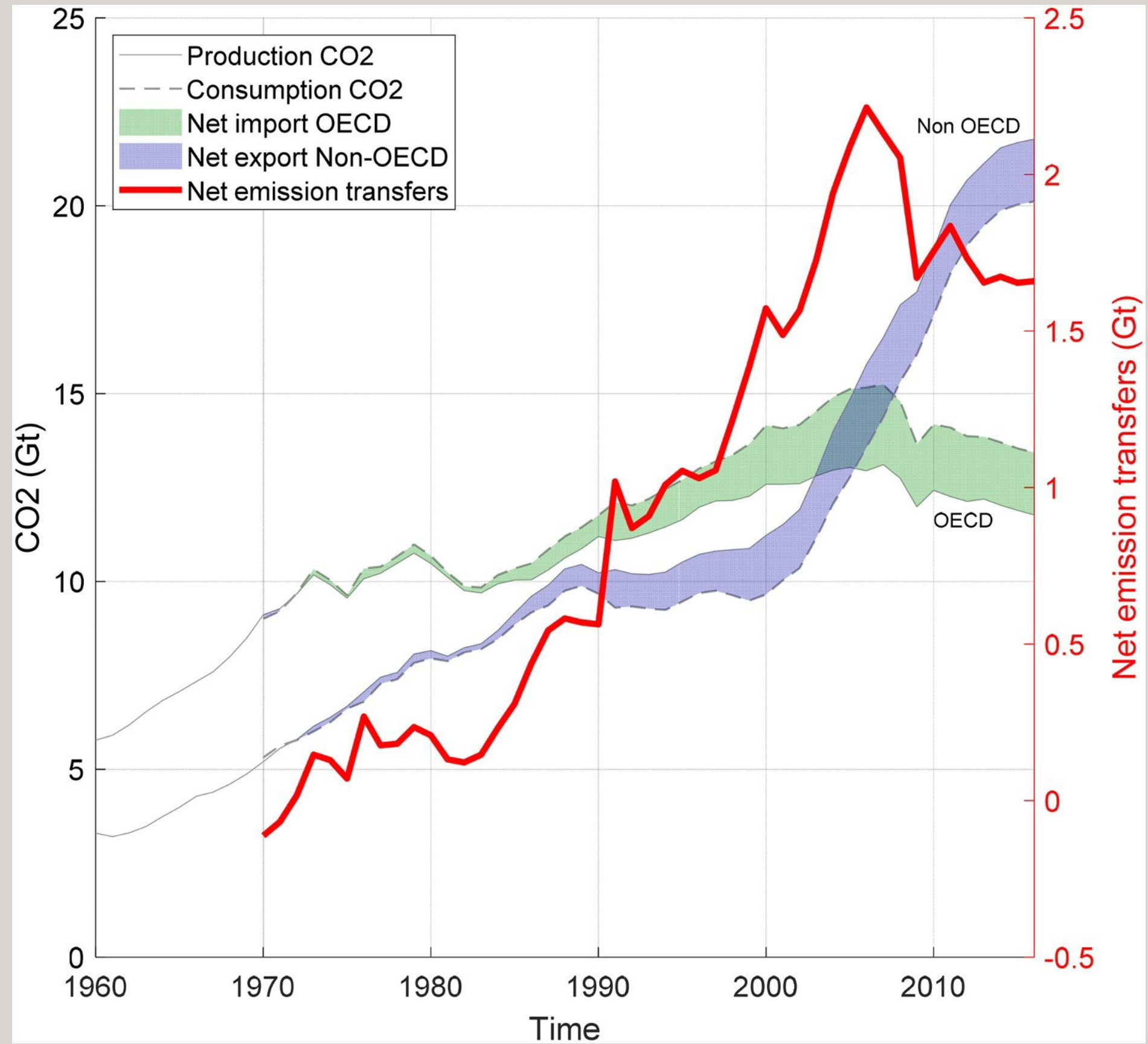
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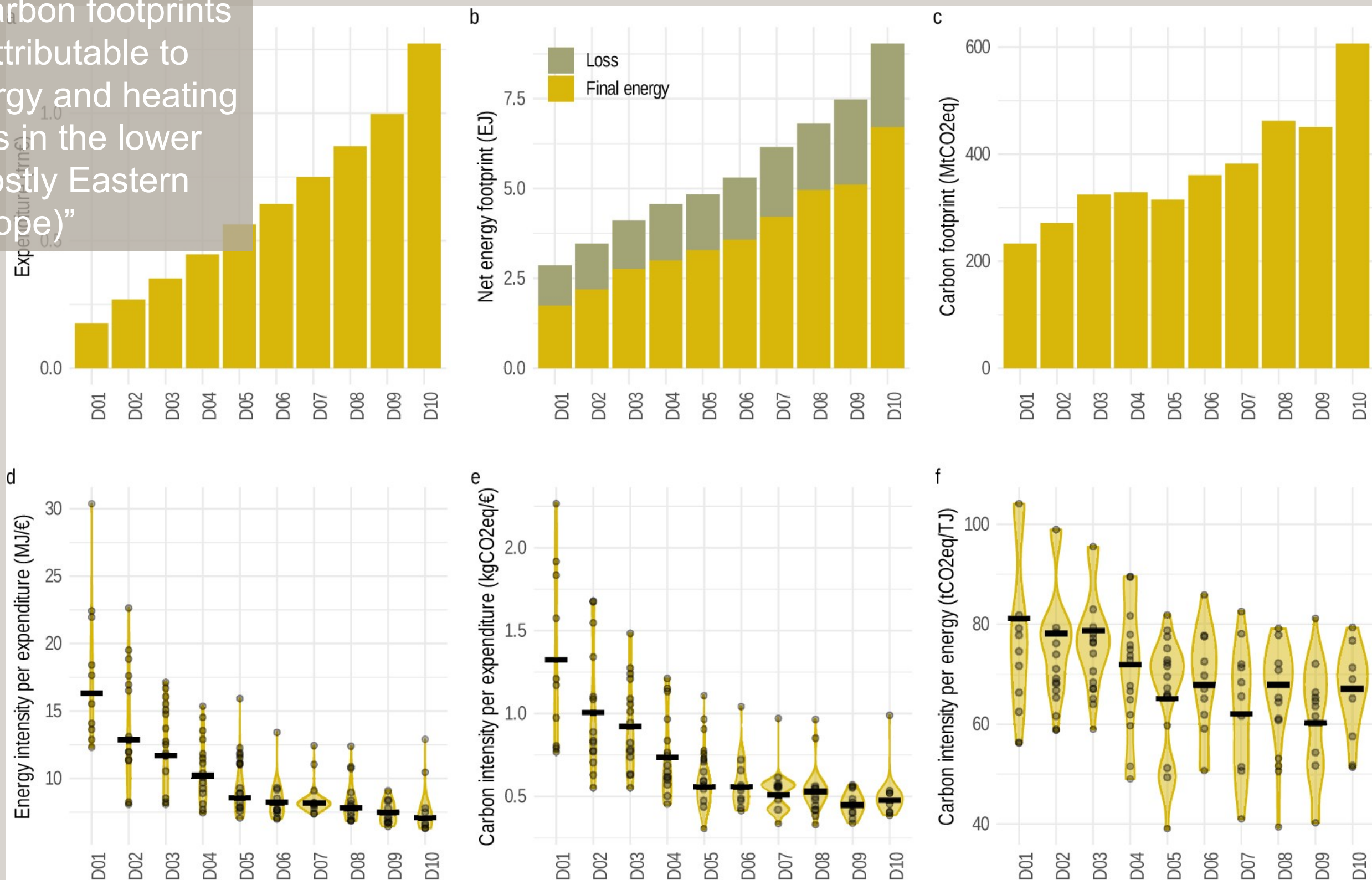
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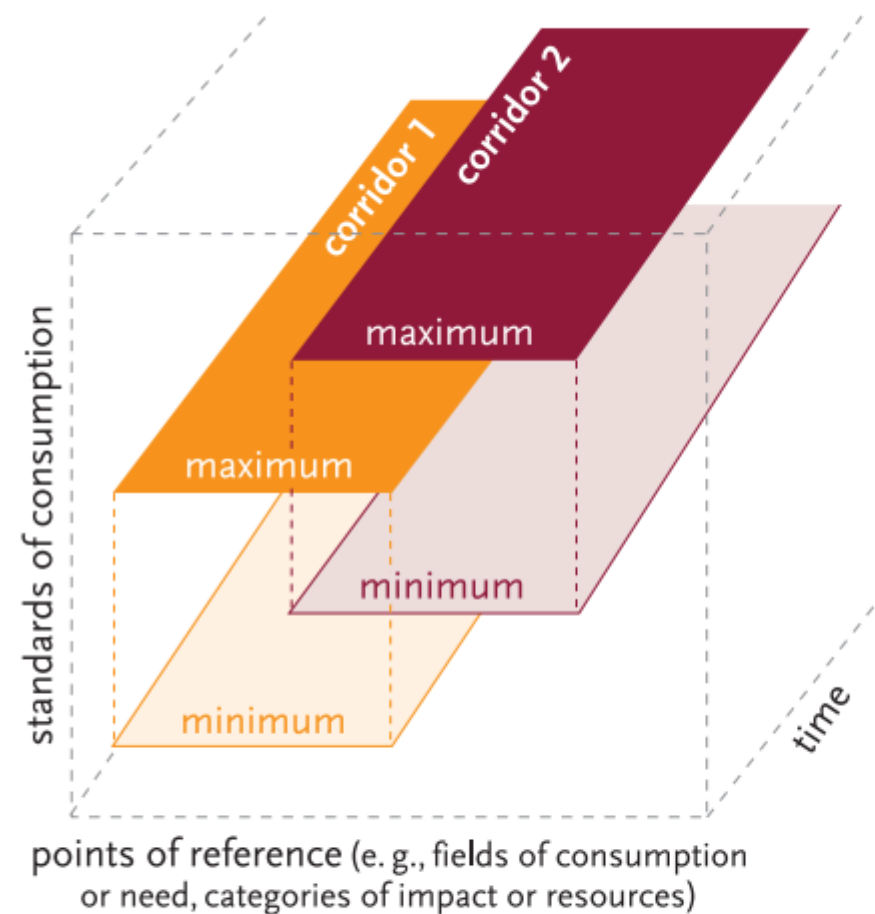


# APPENDIX



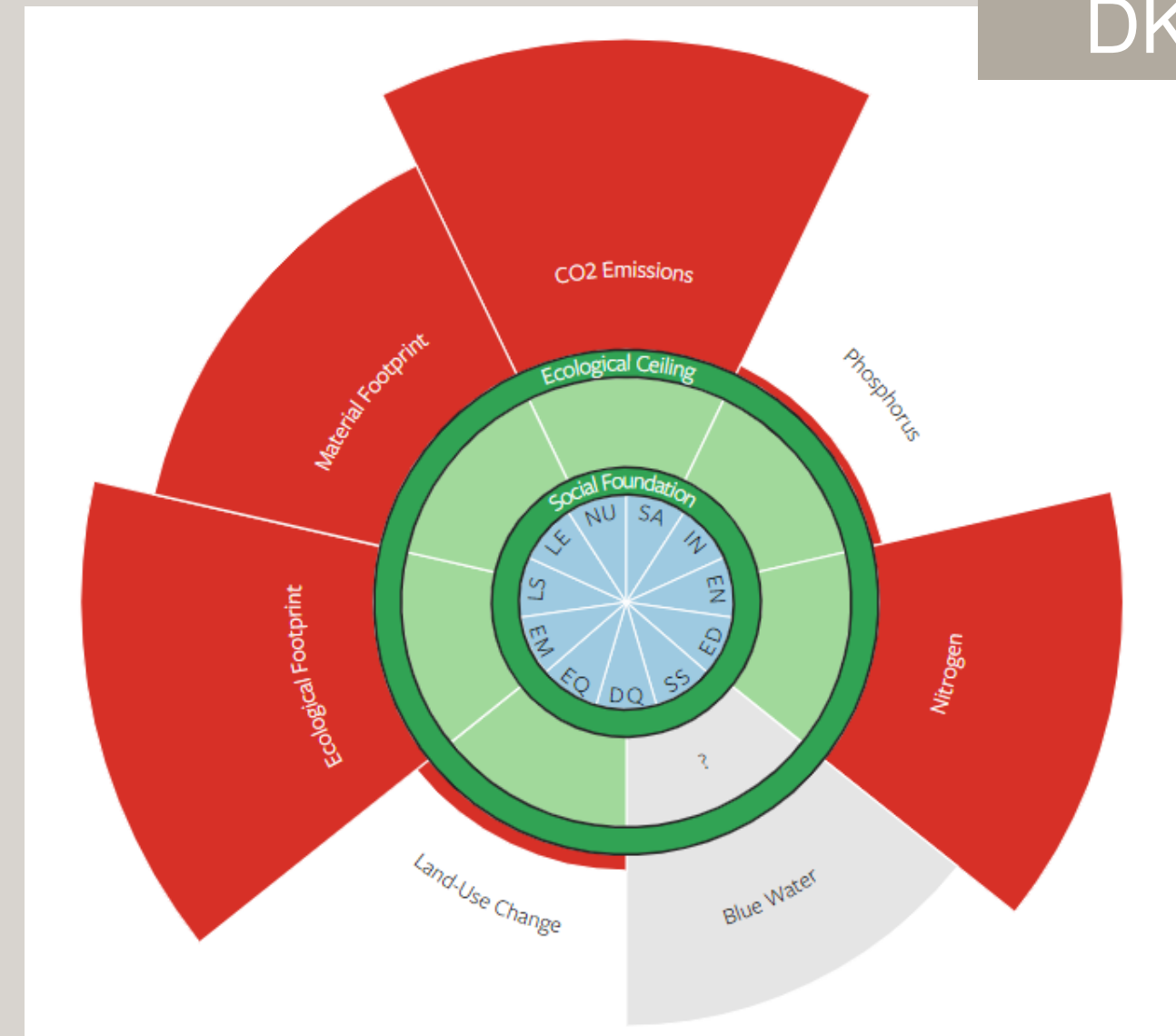
“The lower inequality of energy and carbon footprints is largely attributable to inefficient energy and heating technologies in the lower deciles (mostly Eastern Europe)”





**FIGURE 3:** Corridors of sustainable consumption are defined by minimal and maximal standards of consumption. Their number and the degree of overlap depends on how many points of reference (fields of consumption, environmental and social impact categories, etc.) will prove to be reasonable and on how much these will be disjoint. The corridors will have to be readjusted periodically.

GAIA 23/S1 (2014): 184–192 | doi: [10.14512/gaia.23.S1.6](https://doi.org/10.14512/gaia.23.S1.6)



“A space in which a good life for all, living now and in the future, is possible within planetary boundaries”