



Climate policy in a chaotic & dangerous world

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Seminar talk at the University of Maryland (online) 9th November 2023

Brief note on myself...




@yl_oswald



<https://github.com/yloswald>

- PostDoc in Agent-based modelling and data science at Uni of Leeds
- PhD in ecological economics at the University of Leeds
- Soon climate/ecological economics at University of Lausanne
- Interests in sustainability, economics, complexity, computational modelling

Goal of this presentation

Present only my
own research

**Collect thoughts,
develop “framework”**

on global crises and
consequences for climate

Discuss with you

Agenda

- Introduction
- What do I mean by chaotic & dangerous?
- How is “standard” climate policy affected?
- Inequality as the central force in a chaotic world
- Postgrowth/Degrowth in a chaotic and dangerous world

The “big” guiding questions

Can countries still focus on mitigating emissions?

How to do it faster despite turmoil?

What are the consequences for adaptation?

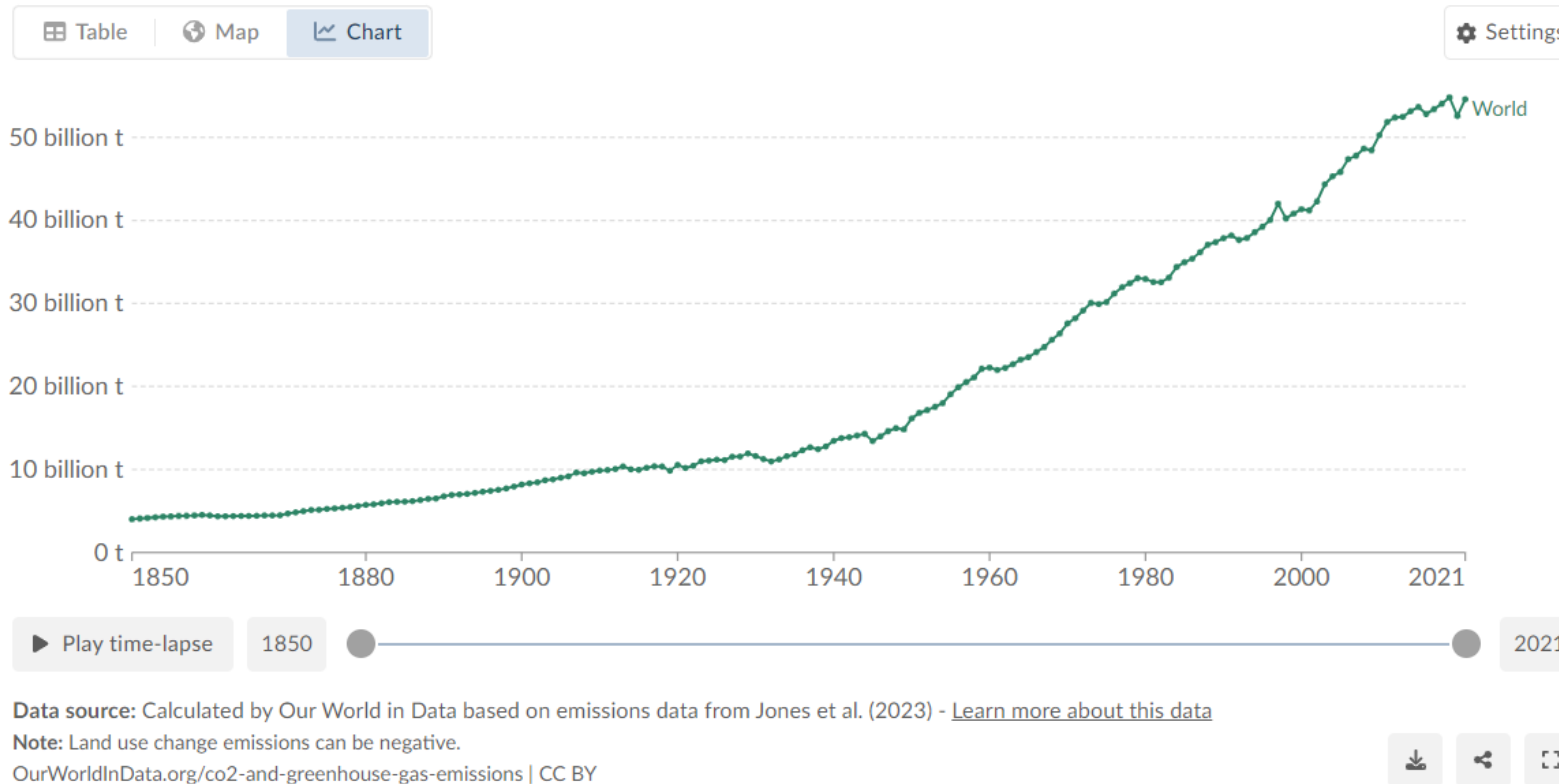
What will actually work in terms of policy?

Emissions are up as always – despite fast renewable growth (i)

Greenhouse gas emissions

Greenhouse gas emissions include carbon dioxide, methane and nitrous oxide from all sources, including agriculture and land use change. They are measured in carbon dioxide-equivalents over a 100-year timescale.

Our World
in Data

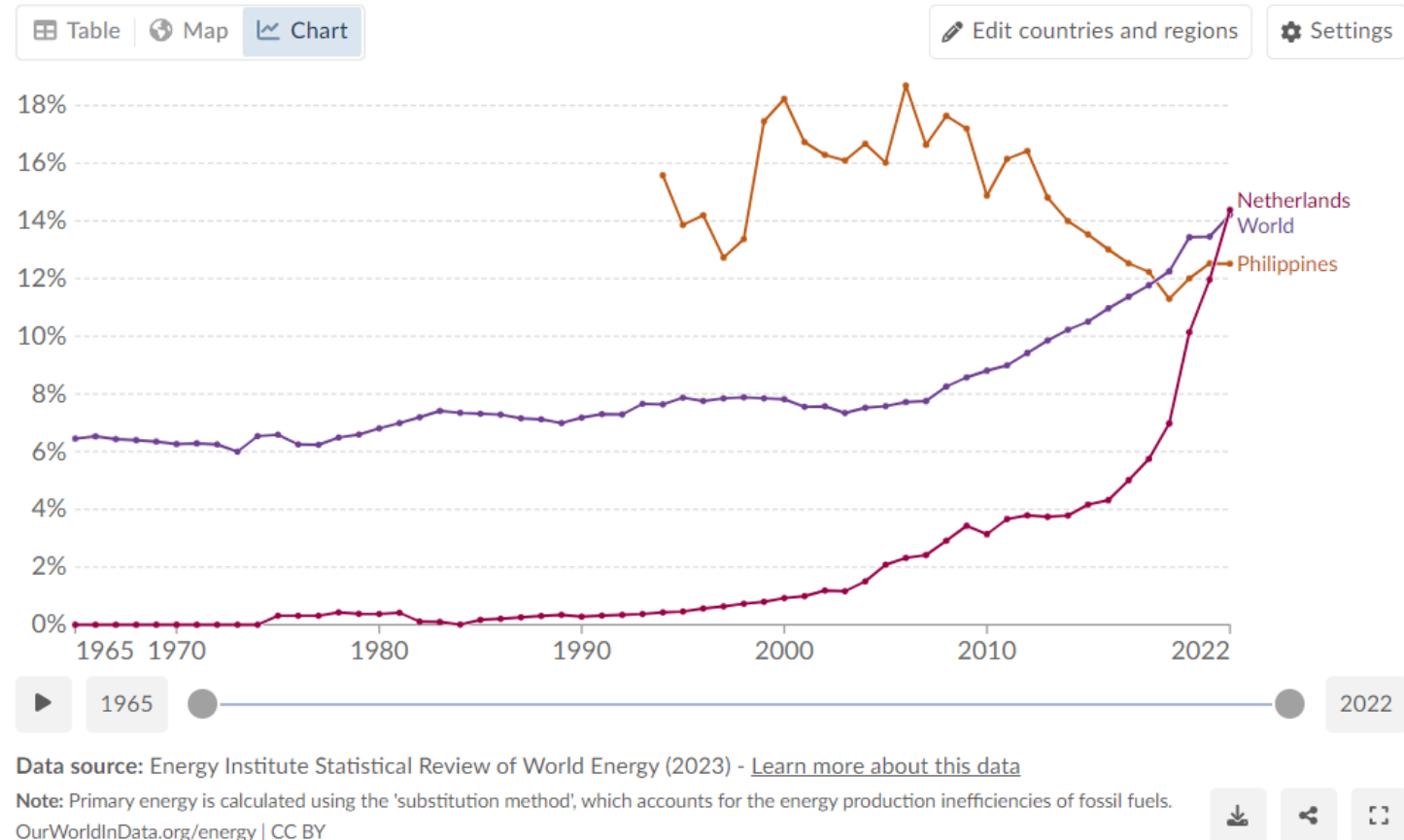


Emissions are up as always – despite fast renewable growth (ii)

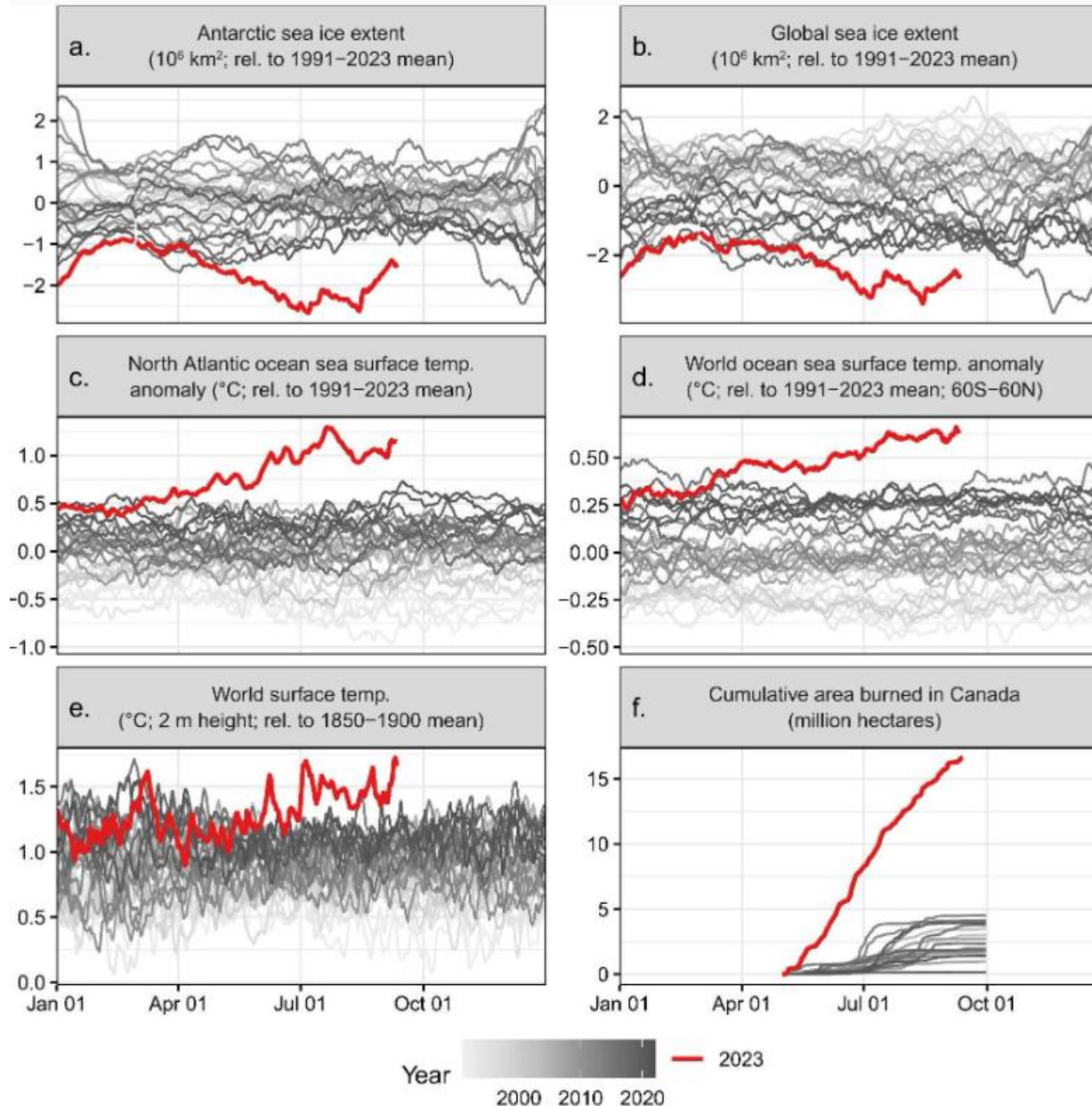
Share of primary energy from renewable sources

Renewable energy sources include hydropower, solar, wind, geothermal, bioenergy, wave, and tidal. They don't include traditional biofuels, which can be a key energy source, especially in lower-income settings.

Our World
in Data



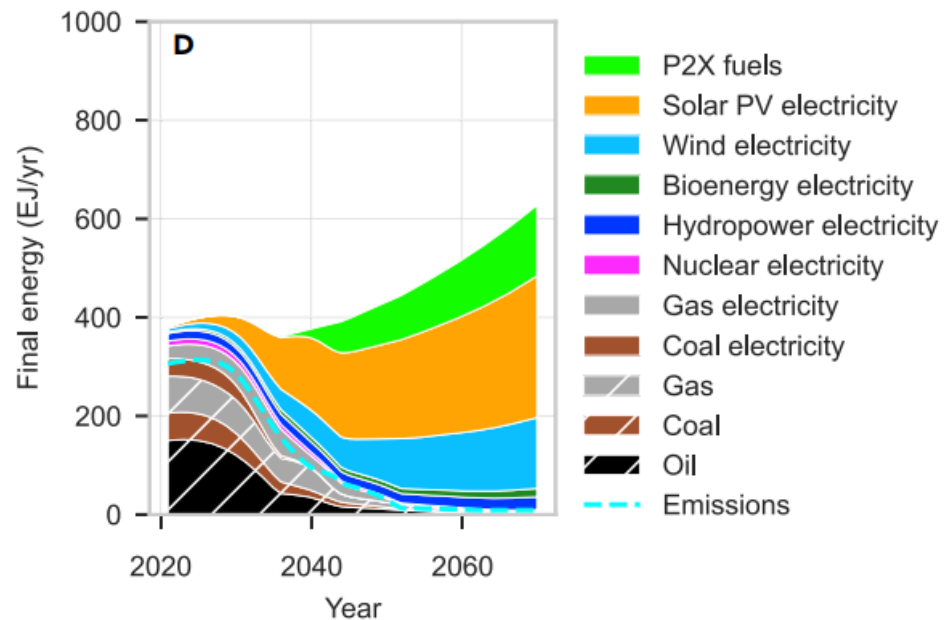
The climate crisis accelerates, we enter uncharted territory



Source Figure: William J Ripple, Christopher Wolf, Jillian W Gregg, Johan Rockström, Thomas M Newsome, Beverly E Law, Luiz Marques, Timothy M Lenton, Chi Xu, Saleemul Huq, Leon Simons, Sir David Anthony King, The 2023 state of the climate report: Entering uncharted territory, *BioScience*, 2023,, biad080, <https://doi.org/10.1093/biosci/biad080>

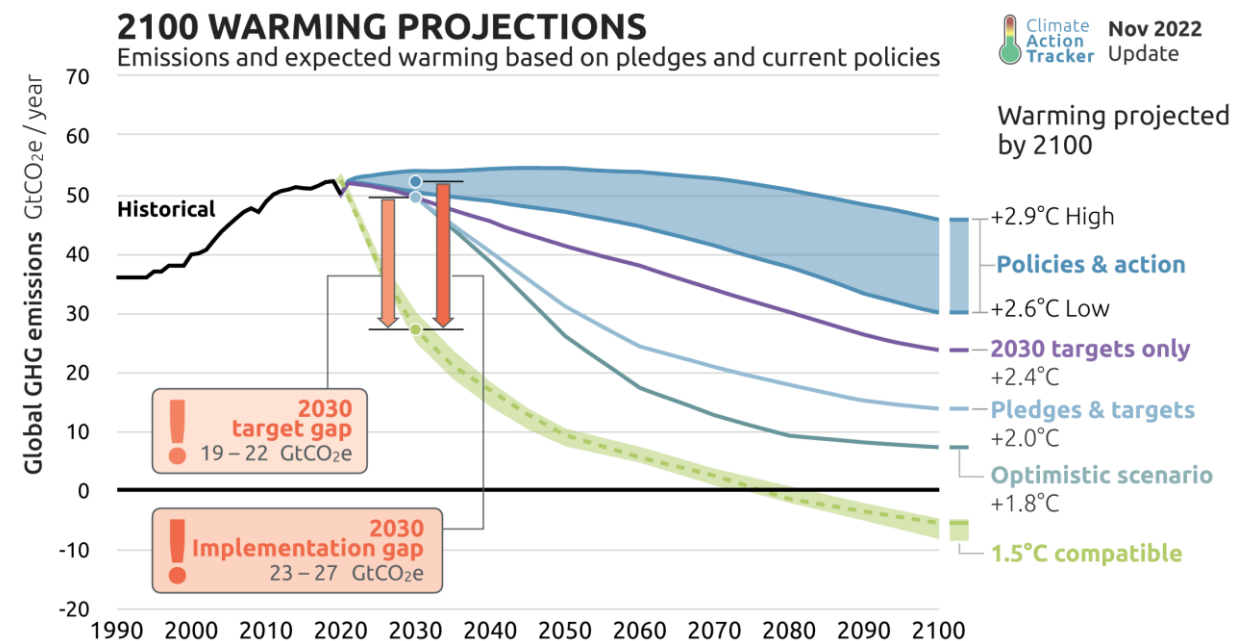
Is there a tipping point in energy system transformation? – and all good?

- Some say “yes”/are optimistic



Source: Figure 6 of Way, R., Ives, M. C., Mealy, P., & Farmer, J. D. (2022). Empirically grounded technology forecasts and the energy transition. *Joule*, 6(9), 2057-2082.

- I am sceptical until it is done/
Not fast enough



Source: <https://climateactiontracker.org/global/temperatures/>

So, is degrowth the solution?

Whereby degrowth ~ ecosocialism transformation

Comment



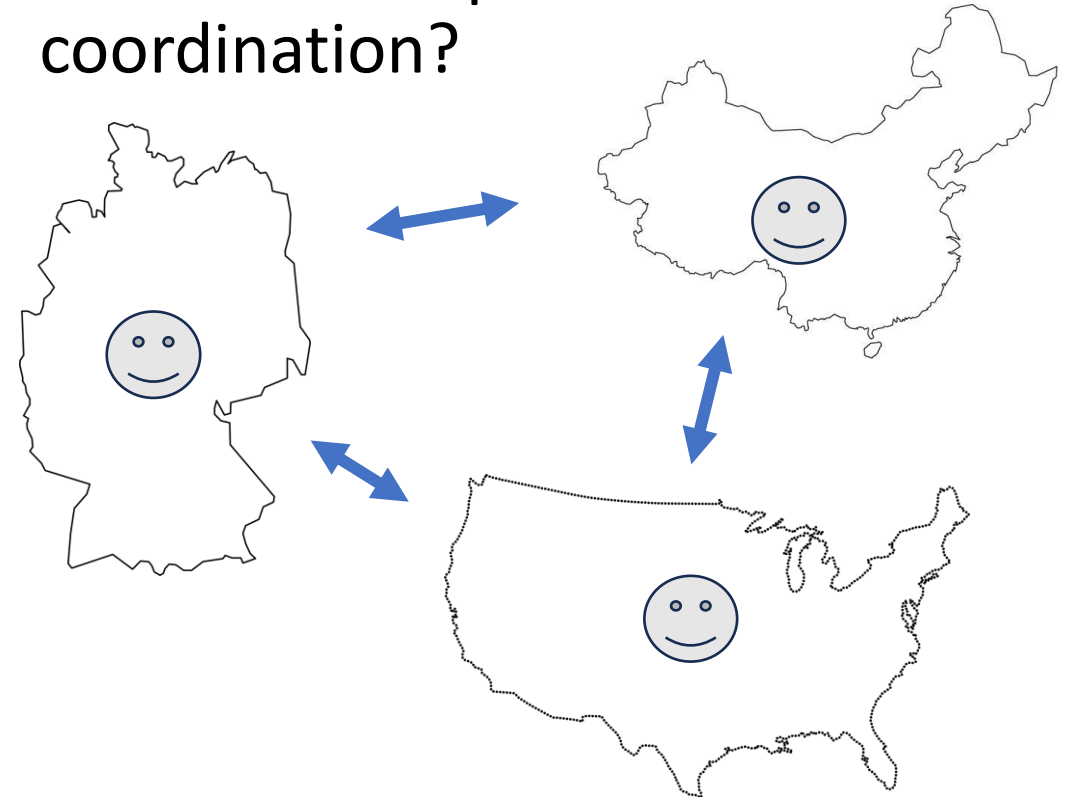
Policies that support degrowth include the provision of high-quality, affordable public housing, such as that in Vienna.

Degrowth can work — here's how science can help

Jason Hickel, Giorgos Kallis, Tim Jackson, Daniel W. O'Neill, Juliet B. Schor,
Julia K. Steinberger, Peter A. Victor & Diana Ürge-Vorsatz

Source: Hickel, J., Kallis, G., Jackson, T., O'Neill, D. W., Schor, J. B., Steinberger, J. K., ... & Ürge-Vorsatz, D. (2022). Degrowth can work—here's how science can help. *Nature*, 612(7940), 400-403.

- One among many problems:
How do we expect int.
coordination?



What do I mean by chaotic & dangerous?

**Poverty and
inequality**

**Extreme
poverty
persists**

Pandemic

War

**(Mis-)
information
crisis**

**Rise of
fascism**

Circle of (non-ecological) crises

**“Rise”
Of organized
crime**

**Shooter &
drug crises in
the USA**

**Refugee
crises**

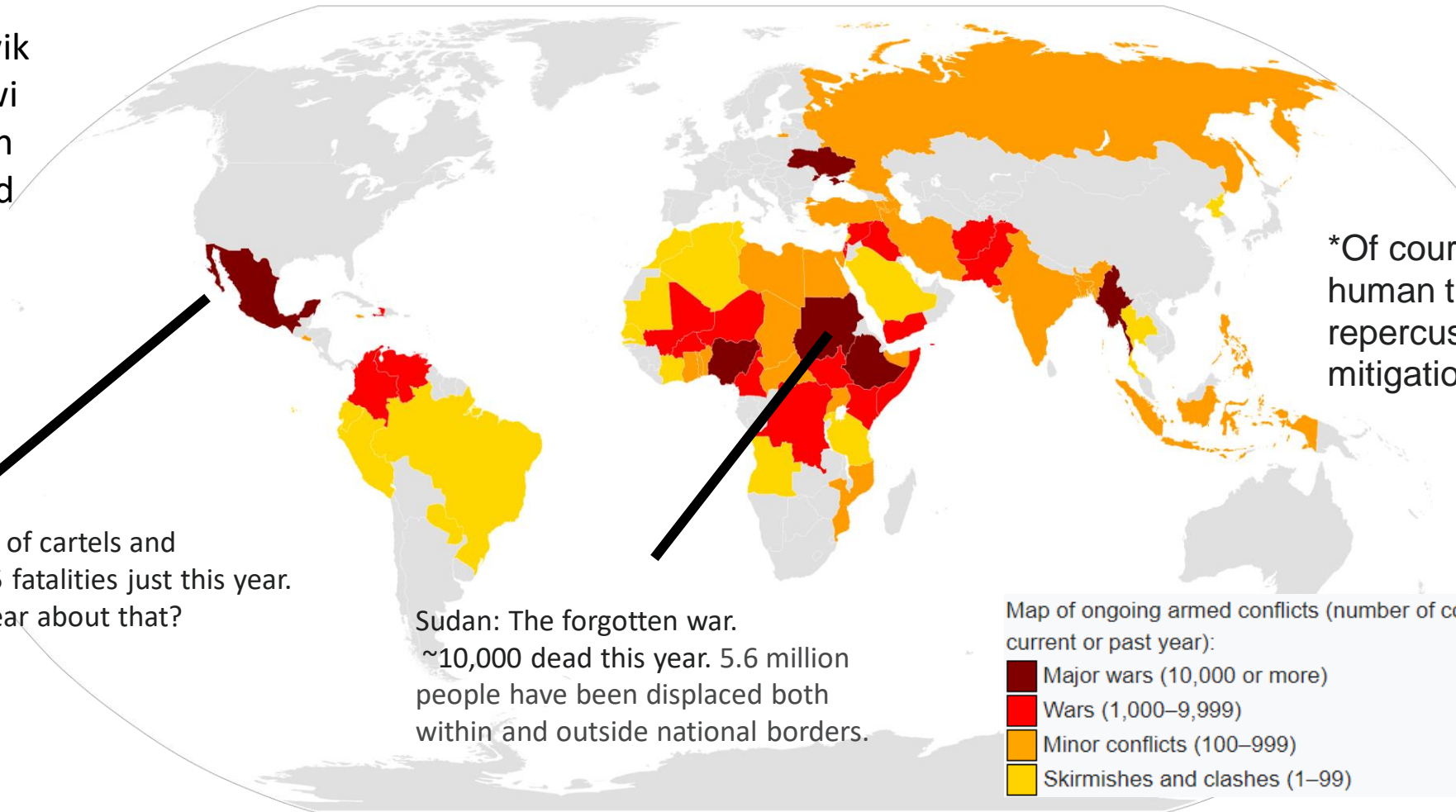
Example: Number of armed conflicts world-wide

https://en.wikipedia.org/wiki/List_of_ongoing_armed_conflicts

Mexico: infighting of cartels and government 5,965 fatalities just this year.
Do people ever hear about that?

Sudan: The forgotten war.
~10,000 dead this year. 5.6 million people have been displaced both within and outside national borders.

Of course, on top of the human tragedy, this has repercussions for climate mitigation and adaptation..



Example: Information bubbles online. This, latest by now, really worries me too.

Disclaimer: I do not have the truth on the hospital tragedy or the middle east conflict, but it is just an illustration here for the chaos and the hyper polarization online. My point is that online bubbles and information “war” create strong feedback loops and likely more chaos ultimately.

News | Israel-Palestine conflict

Investigations reveal discrepancies in Israel's Gaza hospital attack claims

As Israel bombards Gaza, media organisations and researchers are investigating what happened at the al-Ahli Arab Hospital where officials say hundreds were killed.



<https://www.aljazeera.com/news/2023/10/20/what-have-open-source-videos-revealed-about-the-gaza-hospital-explosion>

CNN Investigates: Forensic analysis of images and videos suggests rocket caused Gaza hospital blast, not Israeli airstrike

By Paul P. Murphy, Katie Polglase, Benjamin Brown, [Gianluca Mezzofiore](#) and [Eliza Mackintosh](#), CNN

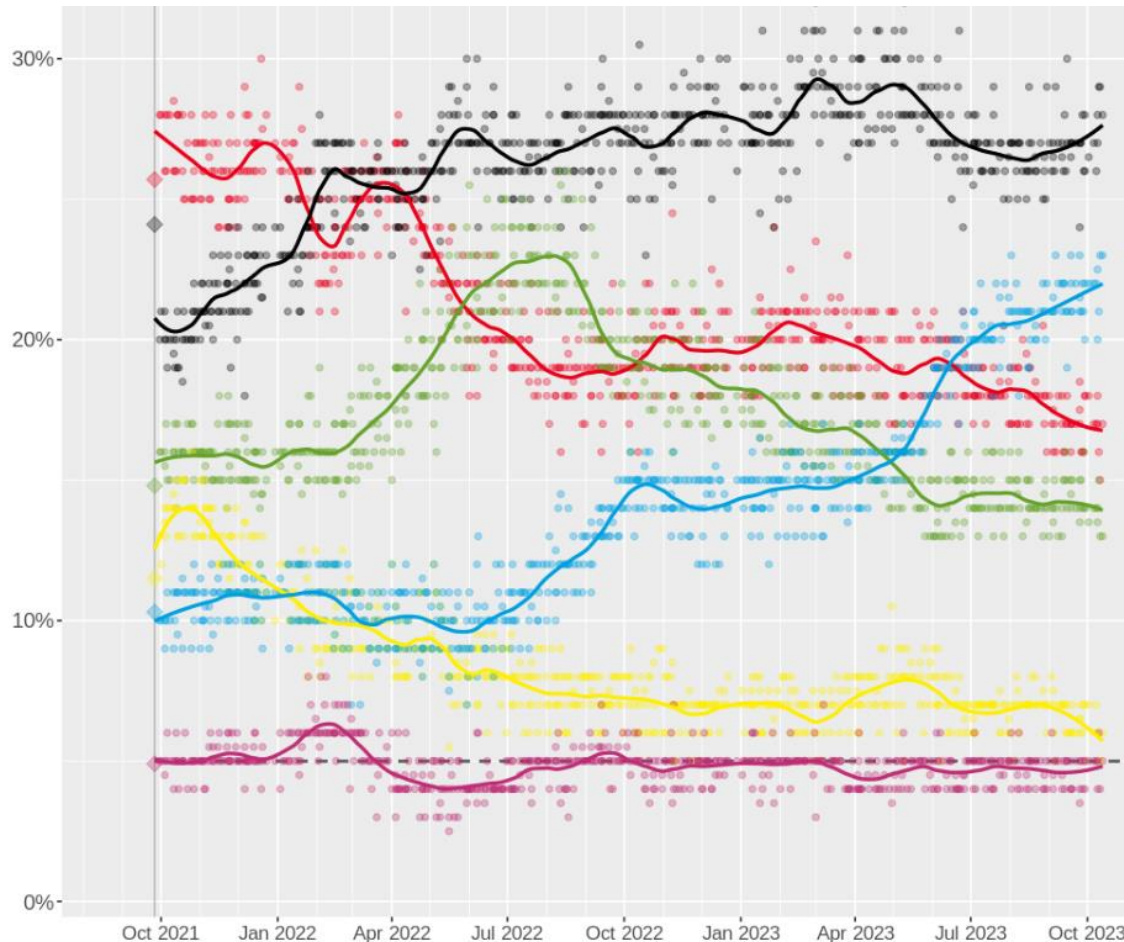
🕒 12 minute read · Updated 9:38 PM EDT, Sun October 22, 2023



(CNN) — In the days since a blast ripped through the packed Al-Ahli Hospital in Gaza City, killing hundreds of Palestinians, dueling claims between Palestinian

<https://edition.cnn.com/2023/10/21/middleeast/cnn-investigates-forensic-analysis-gaza-hospital-blast/index.html>

Example: Far-right on the rise in the polls in Germany (and many other countries)



This blue line is AfD
(Alternative for
Germany)

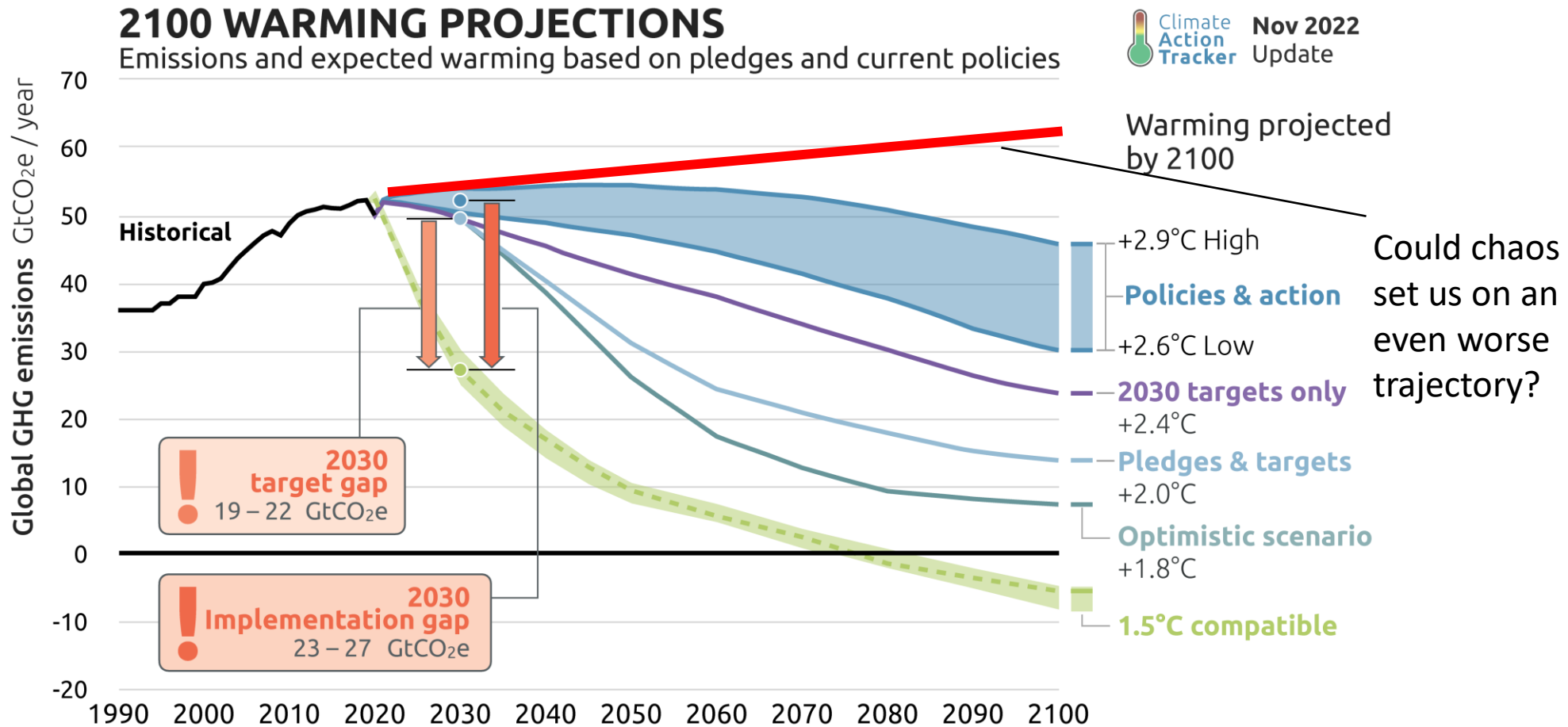
- A far right, in parts, proven Fascist party
- They deny man-made climate change entirely

https://de.wikipedia.org/wiki/Wahl_zum_21._Deutschen_Bundestag/Umfragen_und_Prognosen

How is “standard” climate policy affected?

Even optimistic scenarios do not reach Paris climate goals – Is worse than worst-case scenario still possible?

Figure from
<https://climateactiontracker.org/global/temperatures/>



Some good news: Carbon pricing diffusion

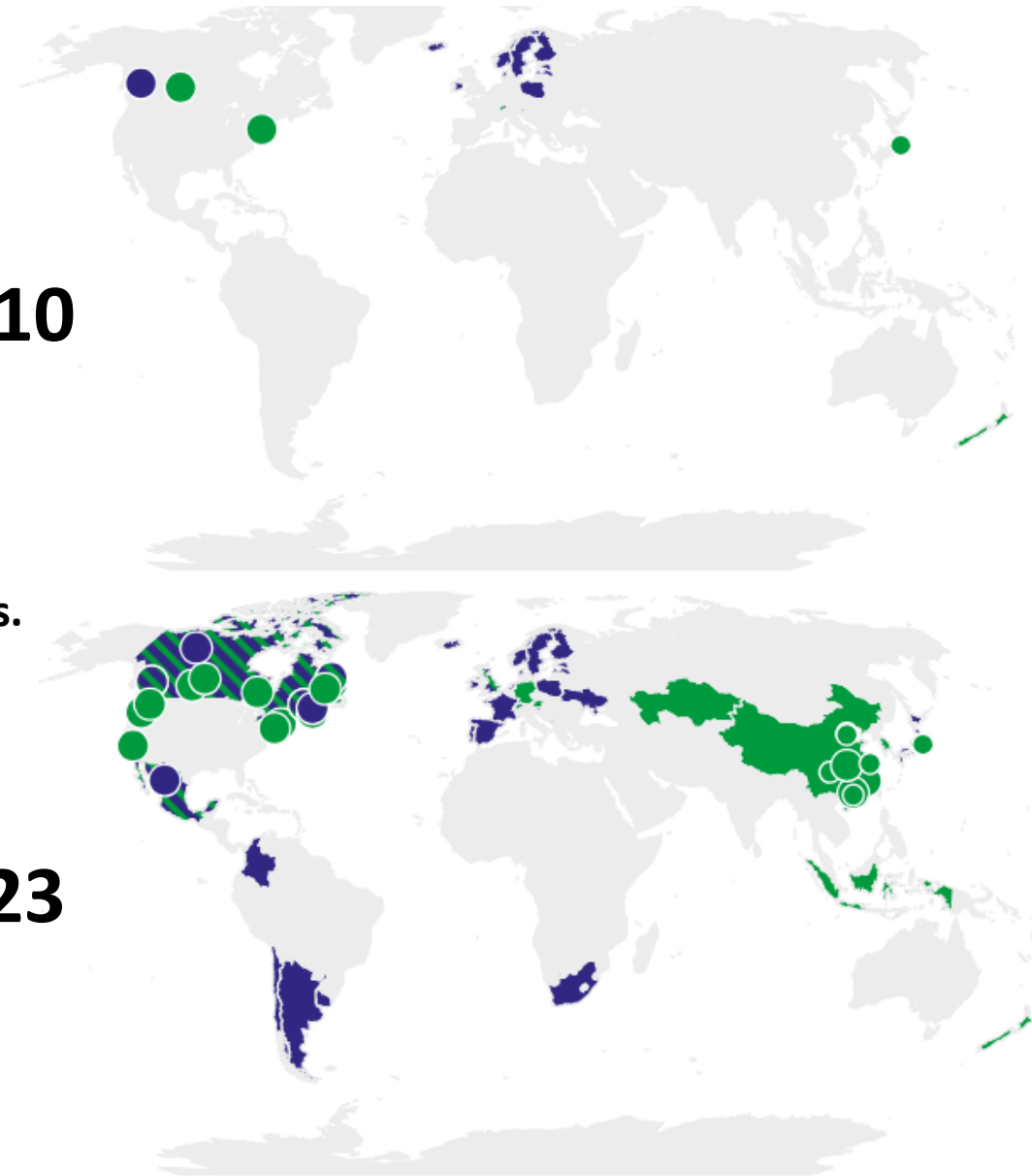
In 2023, these initiatives would cover, 11.66 GtCO₂e, representing 23% of, global GHG emissions.

Source data and map:
https://carbonpricingdashboard.worldbank.org/map_data

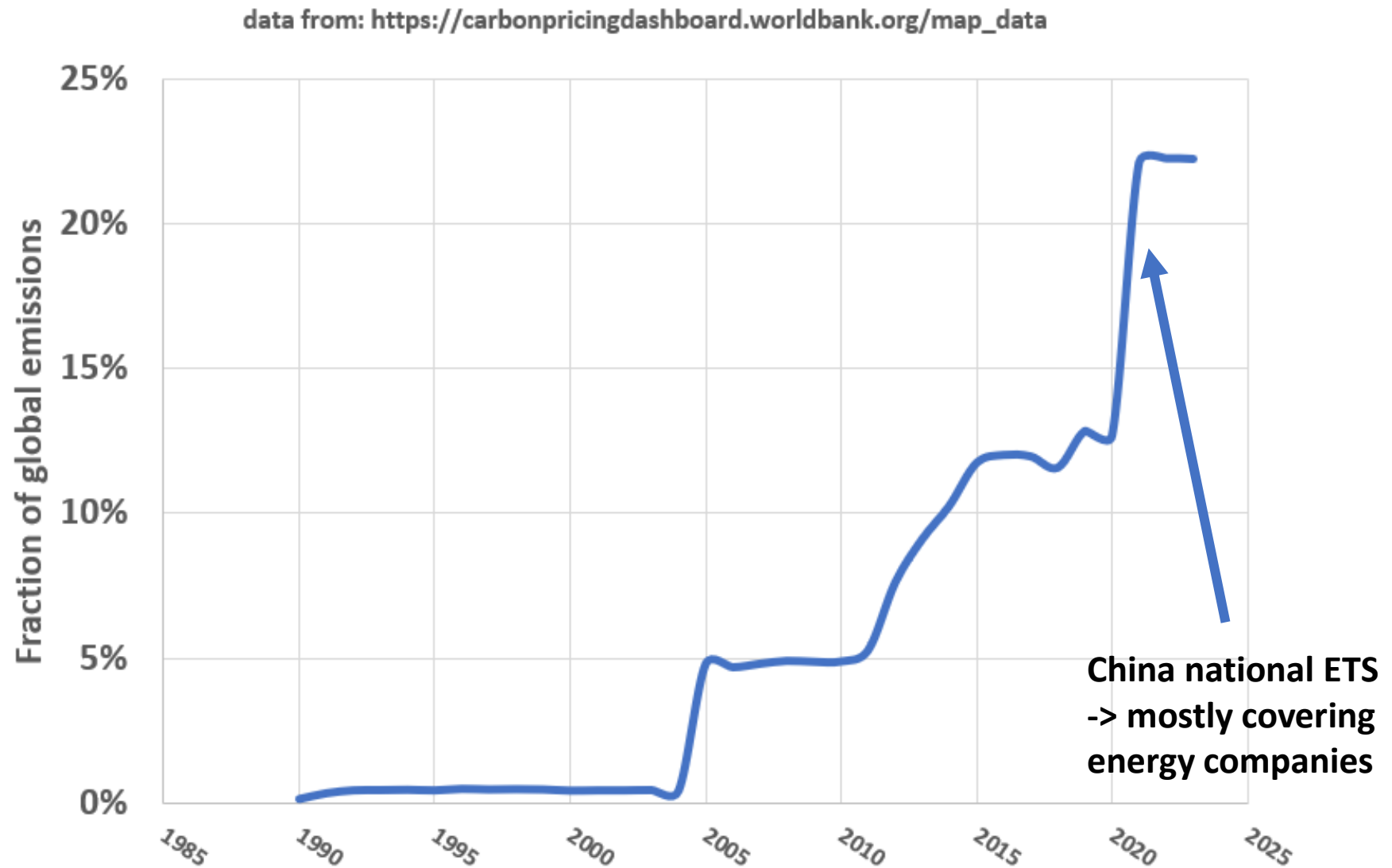
2010

Vs.

2023



Diffusion of carbon pricing still marches on

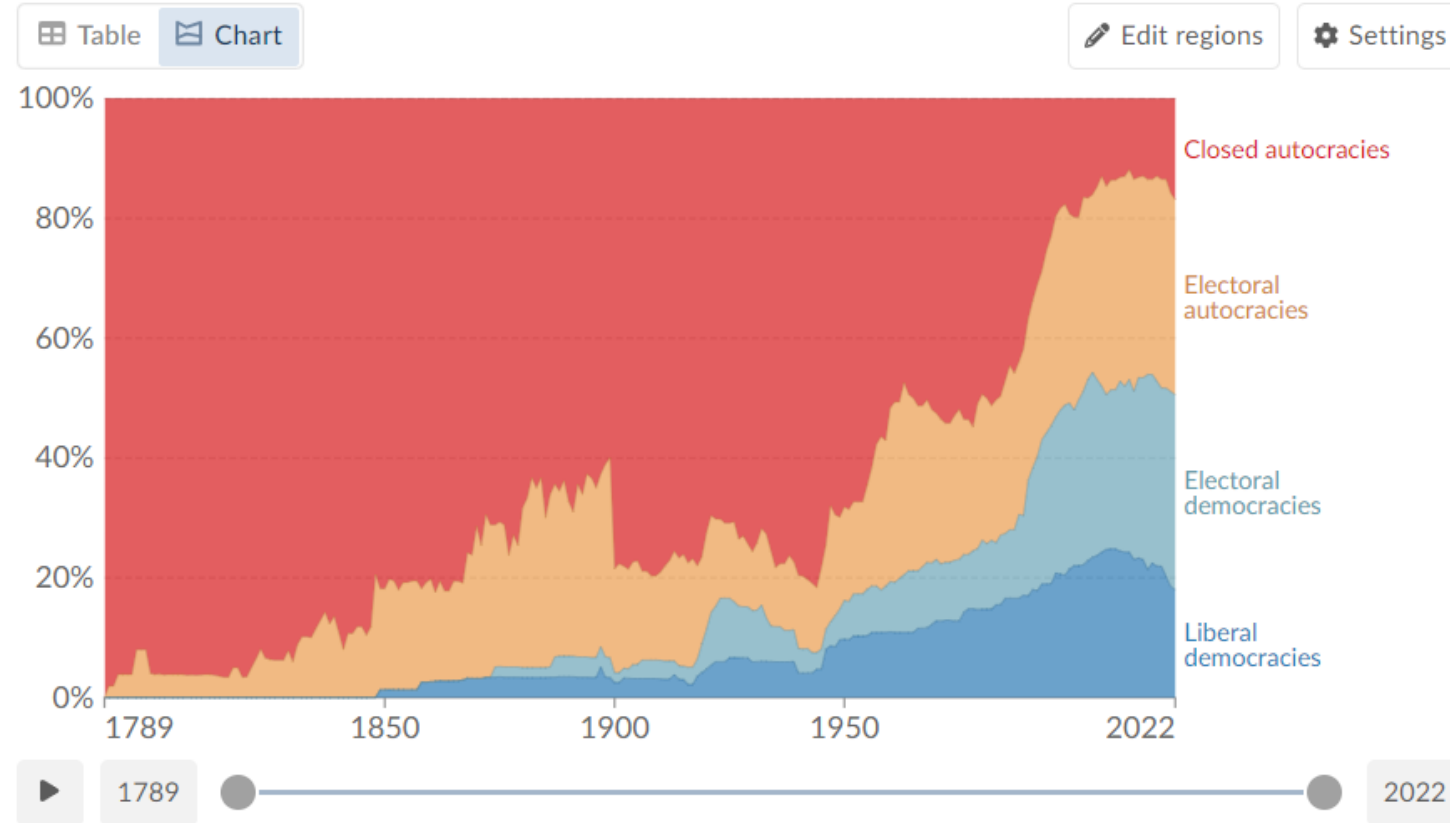


However, from policy diffusion research we know that diffusion might saturate at << 100% | Example democracy

Countries that are democracies and autocracies, World

Our World
in Data

Political regimes based on the criteria of the classification by Lüthmann et al. (2018) and the assessment by V-Dem's experts.



Data source: OWID based on Lüthmann et al. (2018); V-Dem (v13) - [Learn more about this data](#)

Note: The share of closed autocracies increases a lot in 1900 because V-Dem covers many more countries since then, often colonies.

OurWorldInData.org/democracy | CC BY



**Toy illustration
of problem with
partial diffusion:**

**If only few, or
even only one
large country
keeps emitting,
the world keeps
warming**

**According to forecasts of
India's emissions**

**~2.3*(today's emissions) in
2050**

**~ 9 billion metric tons of
carbon dioxide equivalent
(GtCO₂e) in 2050**

Figures based on: Bakır, H., Ağbulut, Ü., Gürel, A. E., Yıldız, G., Güvenç, U., Soudagar, M. E. M., ... & Afzal, A. (2022). Forecasting of future greenhouse gas emission trajectory for India using energy and economic indexes with various metaheuristic algorithms. *Journal of Cleaner Production*, 360, 131946.

**~20% of today's
emissions**



**Still ~20% of today's
rate of warming**

Policies other than carbon prices?

Example:

Roll-back of phase out policies in the UK including

- Heating
- ICE cars

UK government's **climate policy U-turns** could put legal targets out of reach

The government had already weakened its ambition in its **March 2023 net-zero strategy**

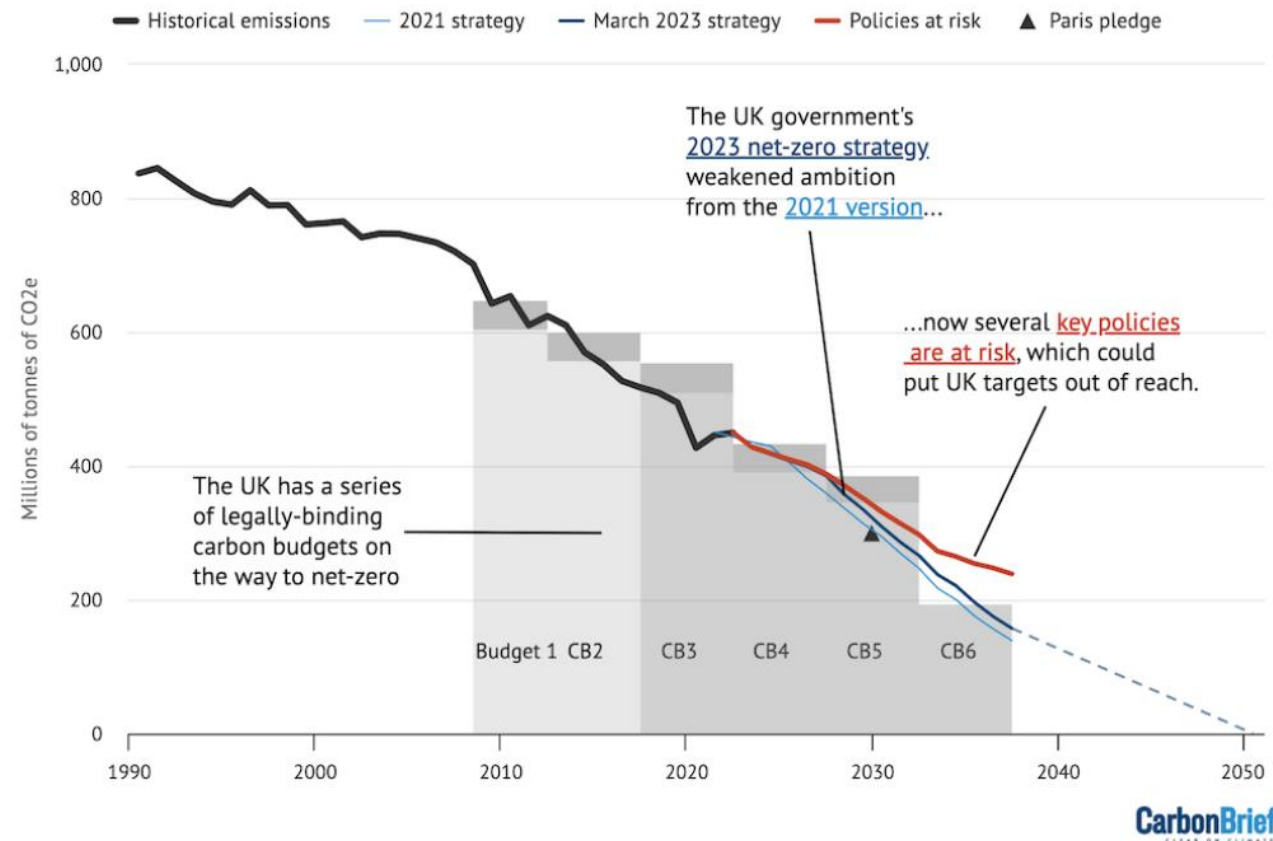
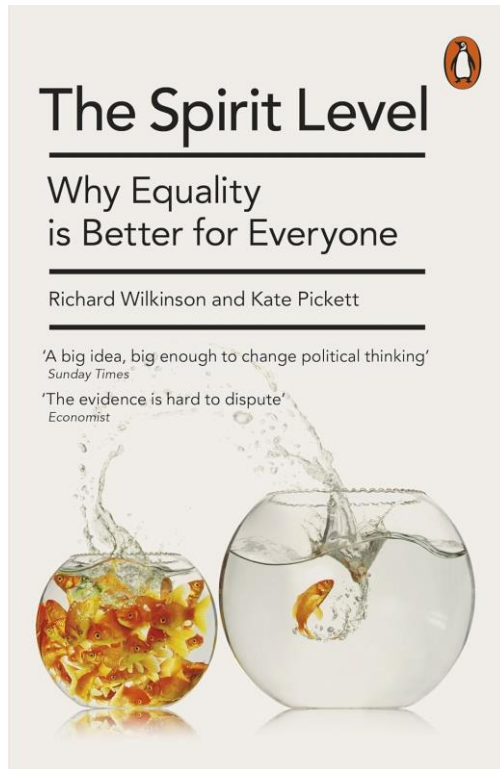


Figure from: <https://www.carbonbrief.org/analysis-uk-governments-climate-u-turns-put-legally-binding-targets-in-jeopardy/#:~:text=These%20rollbacks%20would%20create%20an,be%20put%20out%20of%20reach.>

Inequality as the central force in a chaotic world

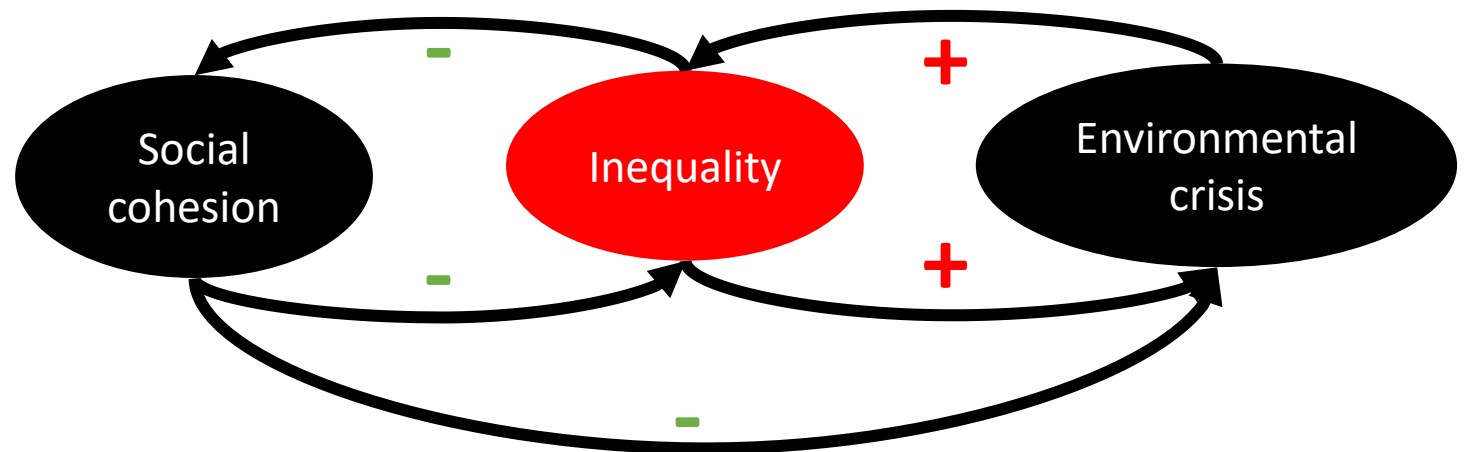
The current “standard model” in ecological economics/sustainability science is that inequality ties all crises together

For example



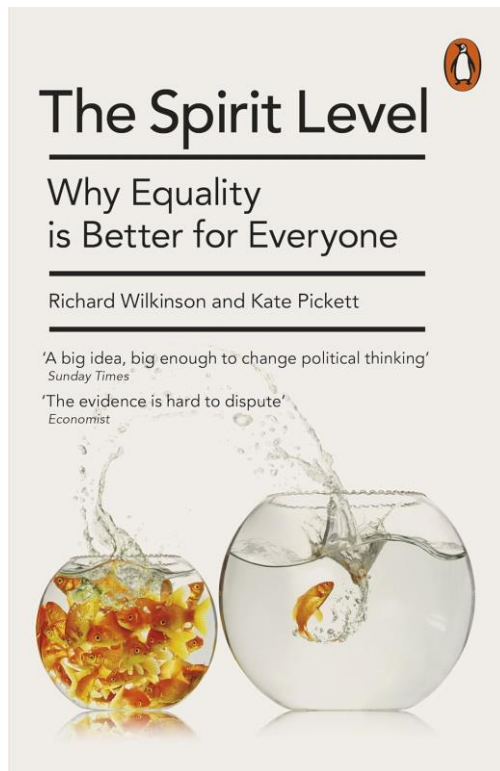
Pickett, K., & Wilkinson, R. (2010). *The spirit level: Why equality is better for everyone*. Penguin UK.

Inequality at the centre of reinforcing feedback loops



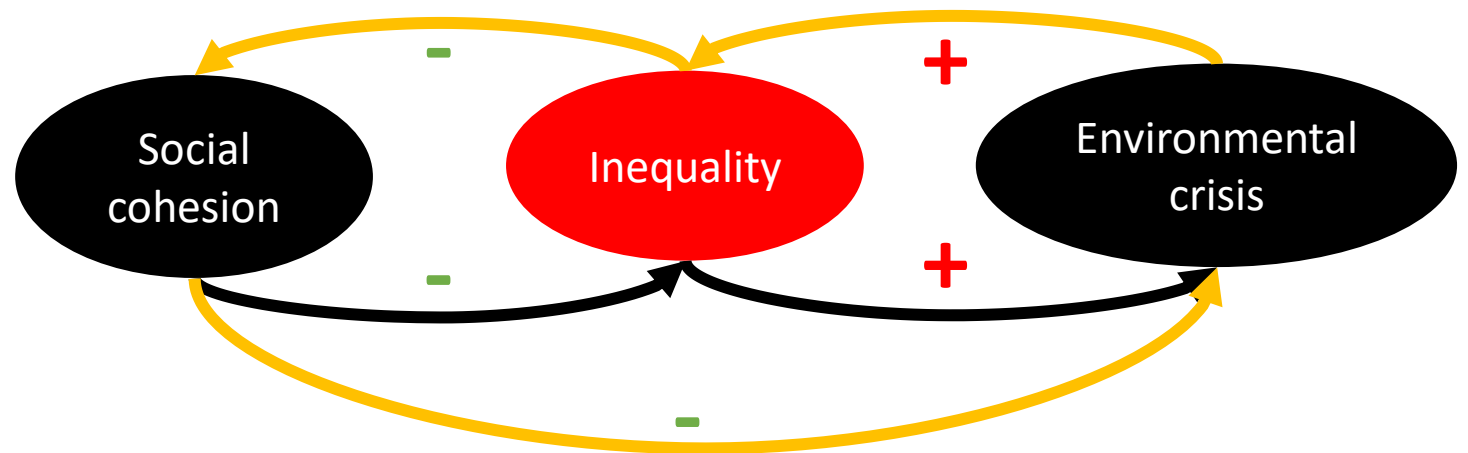
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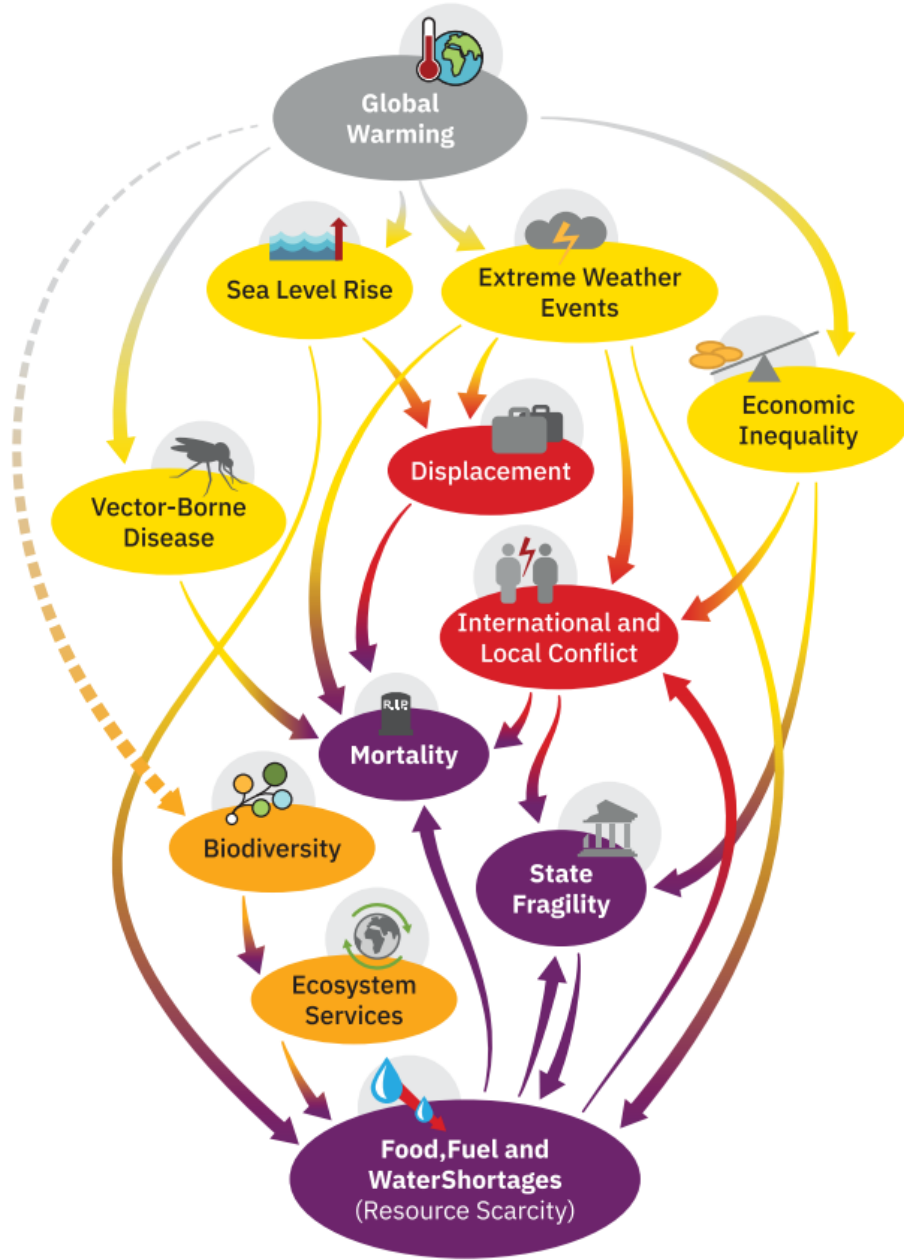
For example



Pickett, K., & Wilkinson, R. (2010). *The spirit level: Why equality is better for everyone*. Penguin UK.

Inequality at the centre of reinforcing feedback loops





Climate is entangled with inequality and “the chaos”

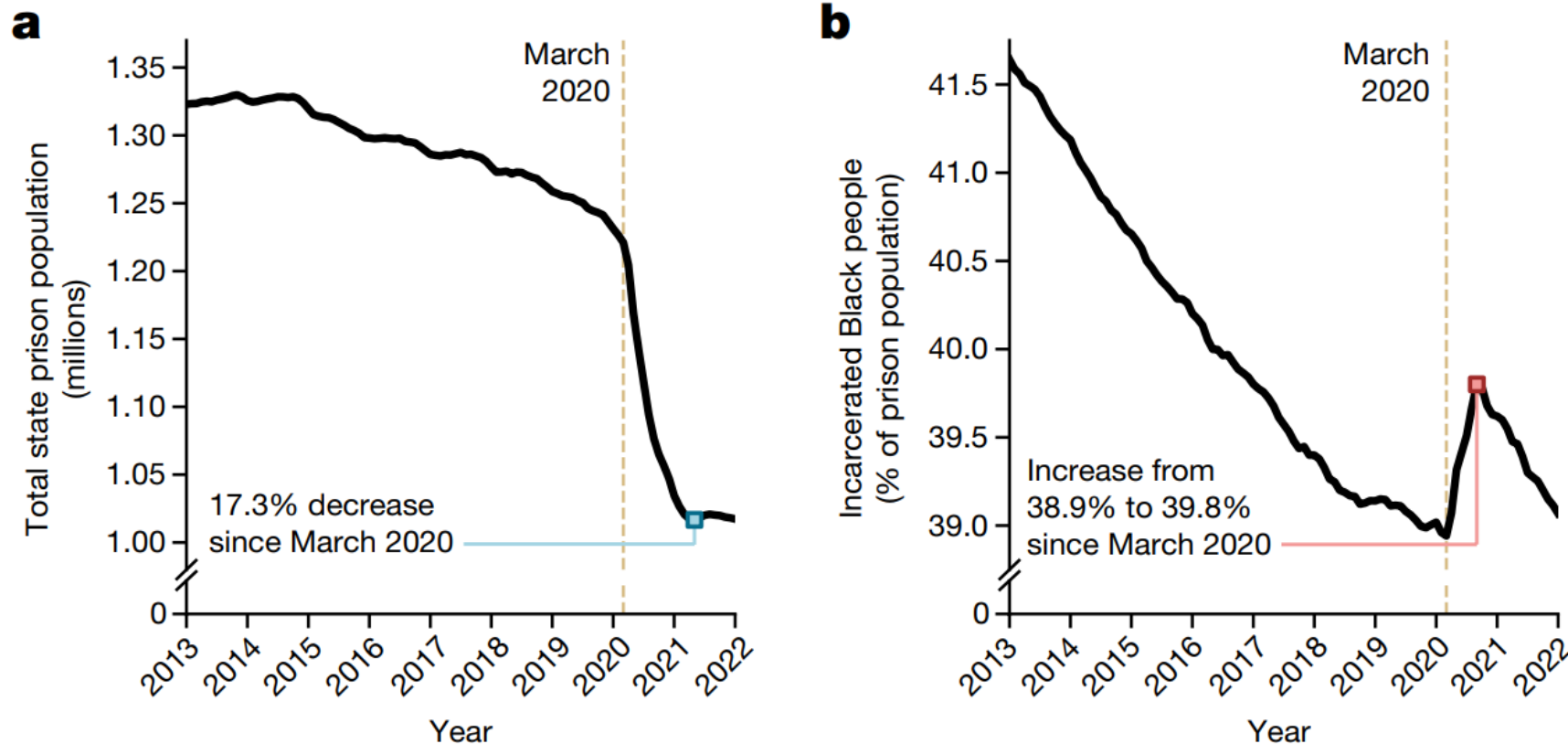
Source Figure: Kemp, L., Xu, C., Depledge, J., Ebi, K. L., Gibbins, G., Kohler, T. A., ... & Lenton, T. M. (2022). Climate Endgame: Exploring catastrophic climate change scenarios. Proceedings of the National Academy of Sciences, 119(34), e2108146119.

The pandemic, one of the chaos phenomena, also highlighted inequality strongly

- Many studies focused on inequality during the pandemic e.g.

Bayati, M., Noroozi, R., Ghanbari-Jahromi, M., & Jalali, F. S. (2022). Inequality in the distribution of Covid-19 vaccine: a systematic review. *International journal for equity in health*, 21(1), 1-9.

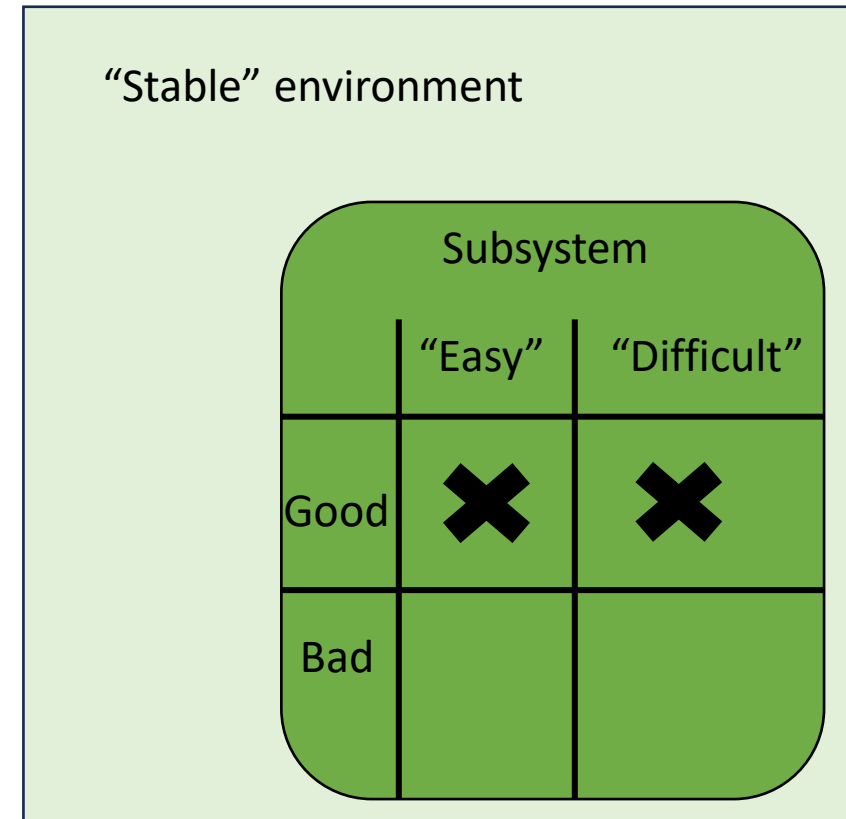
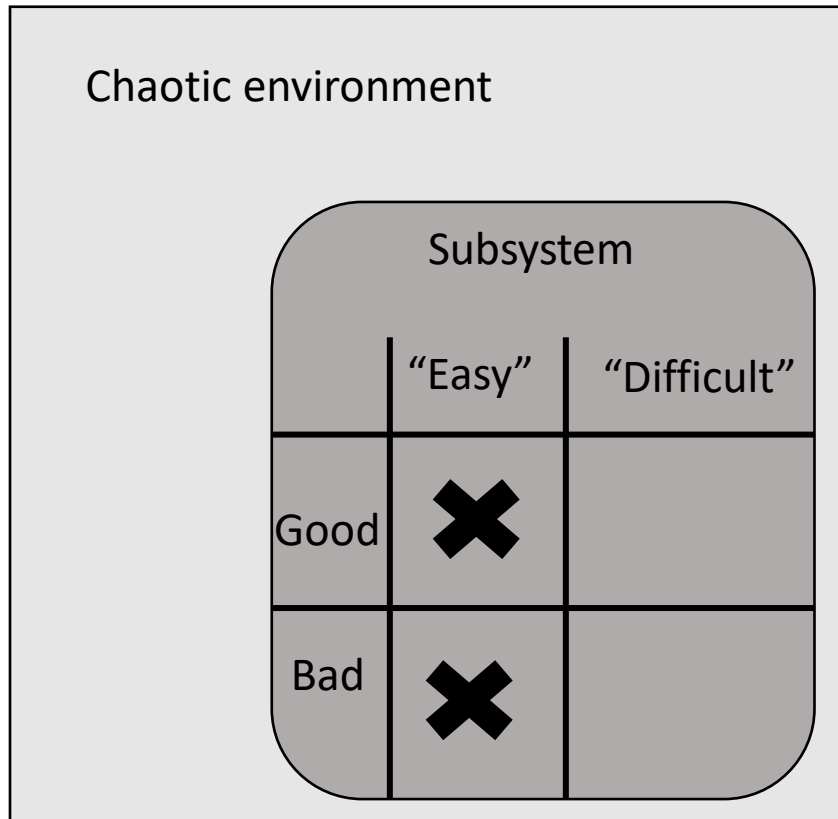
Particularly striking example: Racial inequality in US prisons went up during pandemic




Source Figure: Klein, B., Ogbunugafor, C. B., Schafer, B. J., Bhadracha, Z., Kori, P., Sheldon, J., ... & Hinton, E. (2023). COVID-19 amplified racial disparities in the US criminal legal system. *Nature*, 1-7.

Intermediate lesson?

Chaos brings out “true” inequalities, reverts progress and “enforces” worst system behaviour



My PhD on energy and carbon inequality fits in the inequality literature





ARTICLES

<https://doi.org/10.1038/s41560-020-01017-1>

Global Sustainability

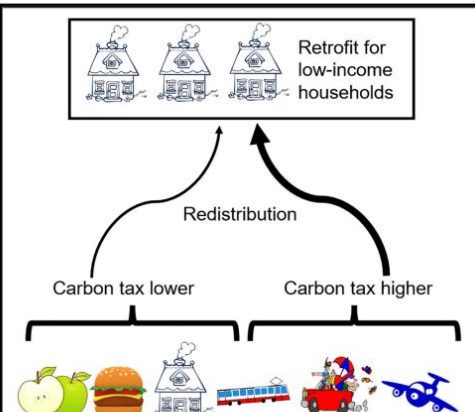
[cambridge.org/sus](https://www.cambridge.org/sus)

Large inequality in international and intranational energy footprints between income groups and across consumption categories

Yannick Oswald¹  

Luxury-focused carbon taxation improves fairness of climate policy

Graphical abstract





Authors
Yannick Oswald,
Joel Millward-Hopkins,
Julia K. Steinberger, Anne Owen,
Diana Ivanova

Correspondence
y-oswald@web.de

In brief
Luxury-focused carbon taxation is an underexplored approach to climate policy. We test it internationally and find that it is generally fairer with respect to emissions abatements and financial burden across the income spectrum of households.

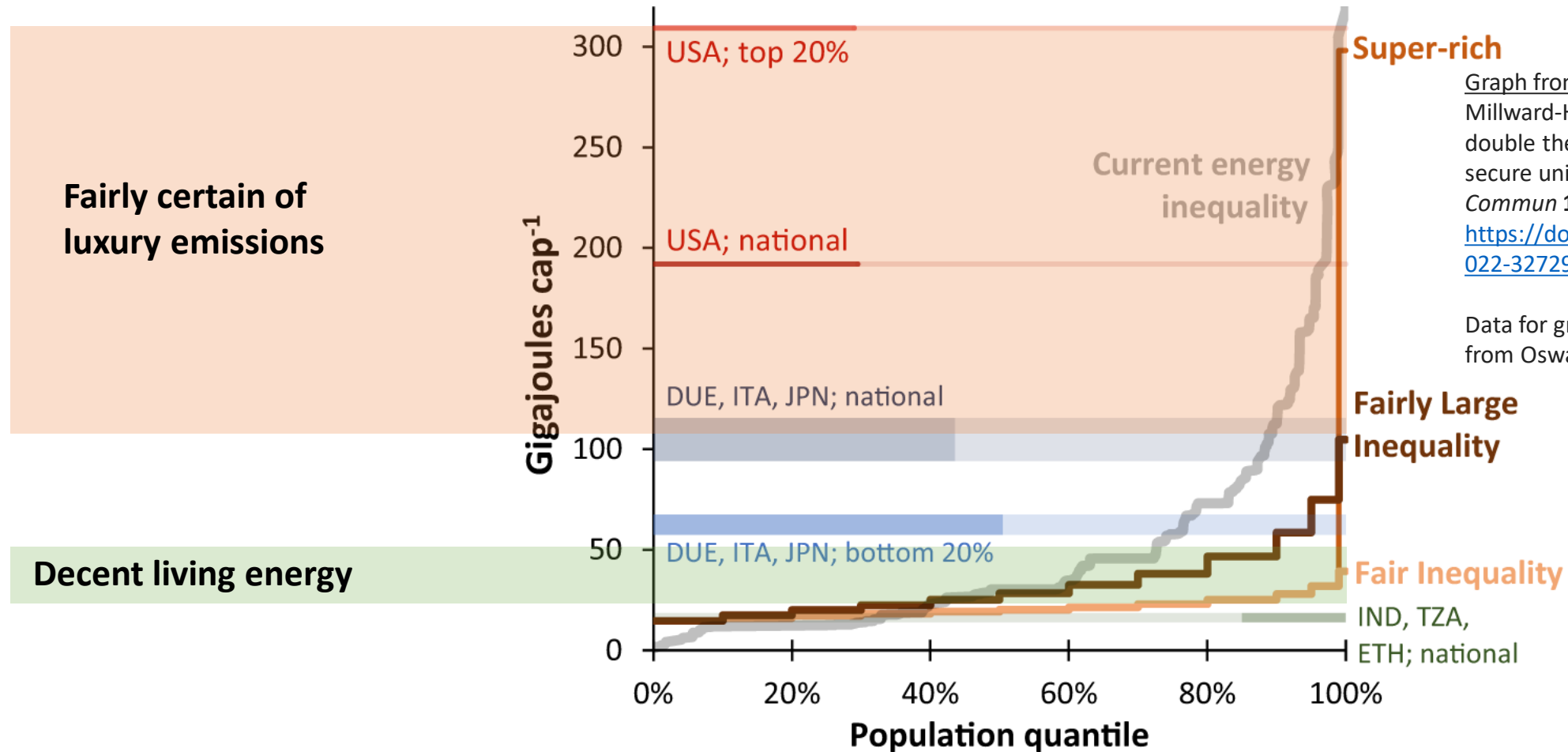
Global redistribution of income and household energy footprints: a computational thought experiment

Y. Oswald¹ , J.K. Steinberger^{1,2}, D. Ivanova¹  and J. Millward-Hopkins¹

¹Sustainability Research Institute, School of Earth and Environment, University of Leeds, Leeds LS2 9JT, UK and ²Institute of Geography and Sustainability, Faculty of Geosciences and Environment, University of Lausanne, Lausanne, Switzerland

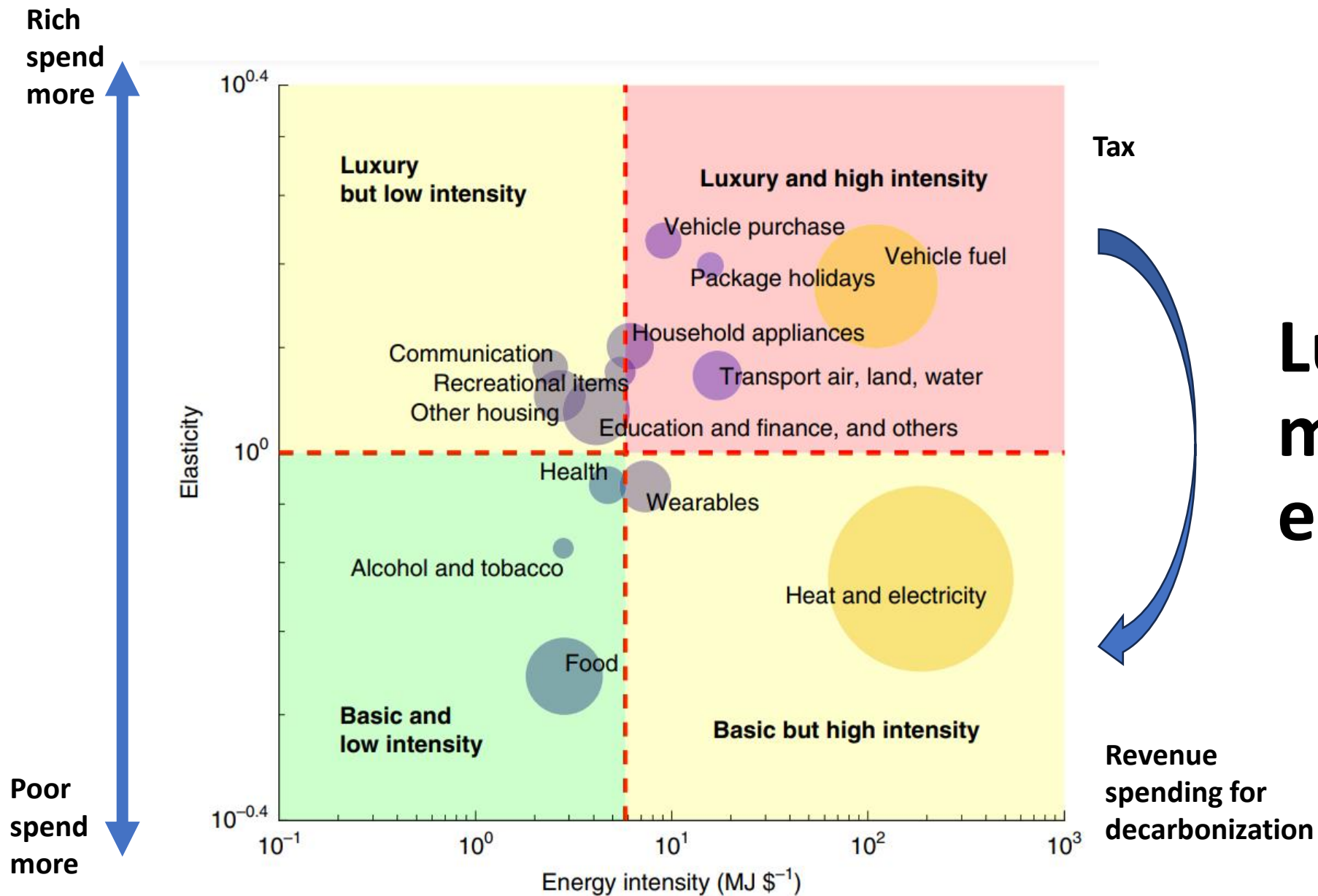
Non-technical summary. Global income inequality and energy consumption inequality are related. High-income households consume more energy than low-income ones, and for different purposes. Here, we explore the global household energy consumption implications of global income redistribution. We show that global income inequality shapes not only the quantity of energy consumption, but also the composition and composition of energy consumption.

Energy inequality determines (i) mitigation options and (ii) adaption capability



Graph from
Millward-Hopkins, J. Inequality can
double the energy required to
secure universal decent living. *Nat
Commun* **13**, 5028 (2022).
<https://doi.org/10.1038/s41467-022-32729-8>

Data for groups and distribution
from Oswald et al. 2020

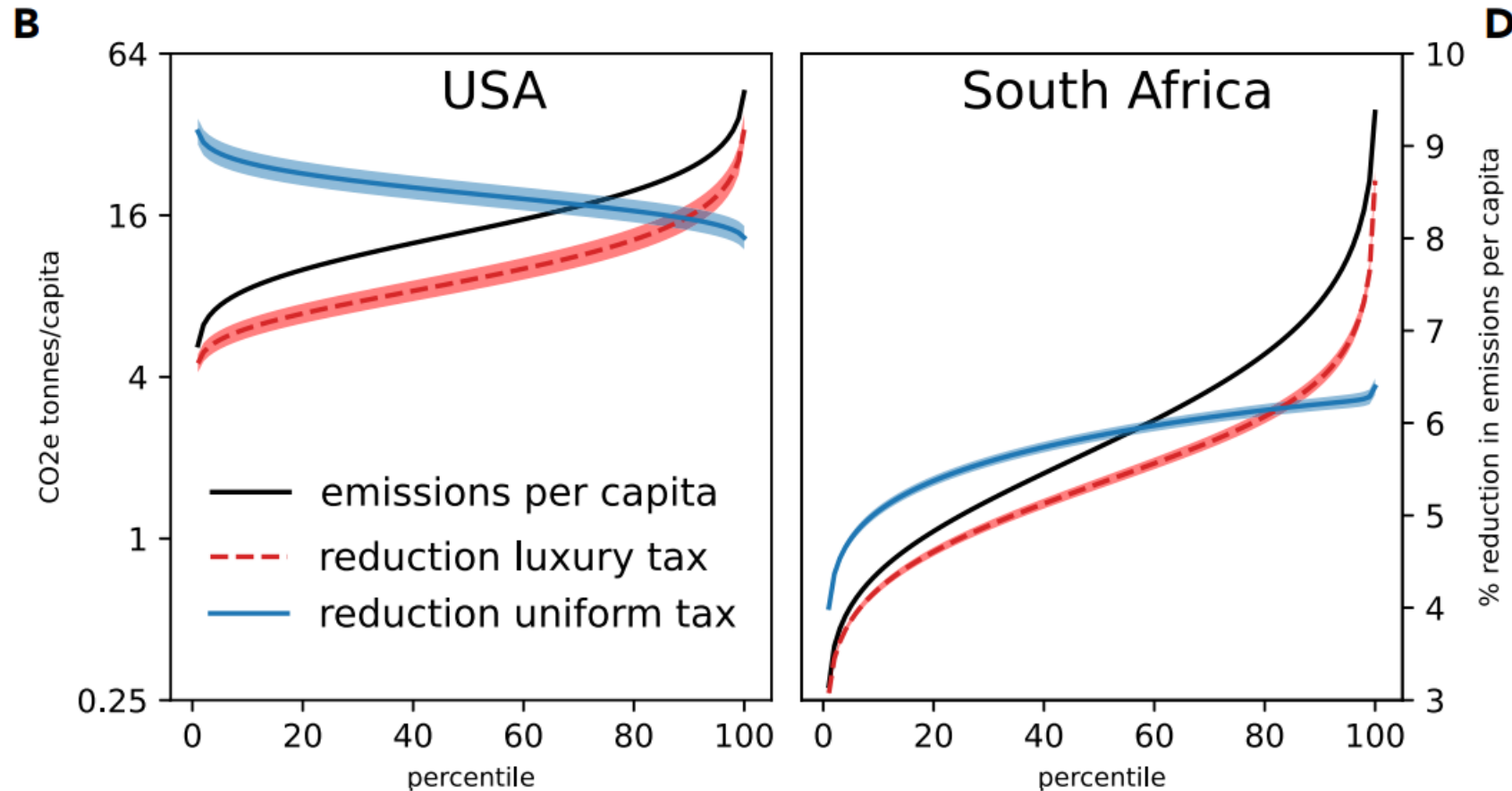


Luxury products may be high energy intensity

Graph from:

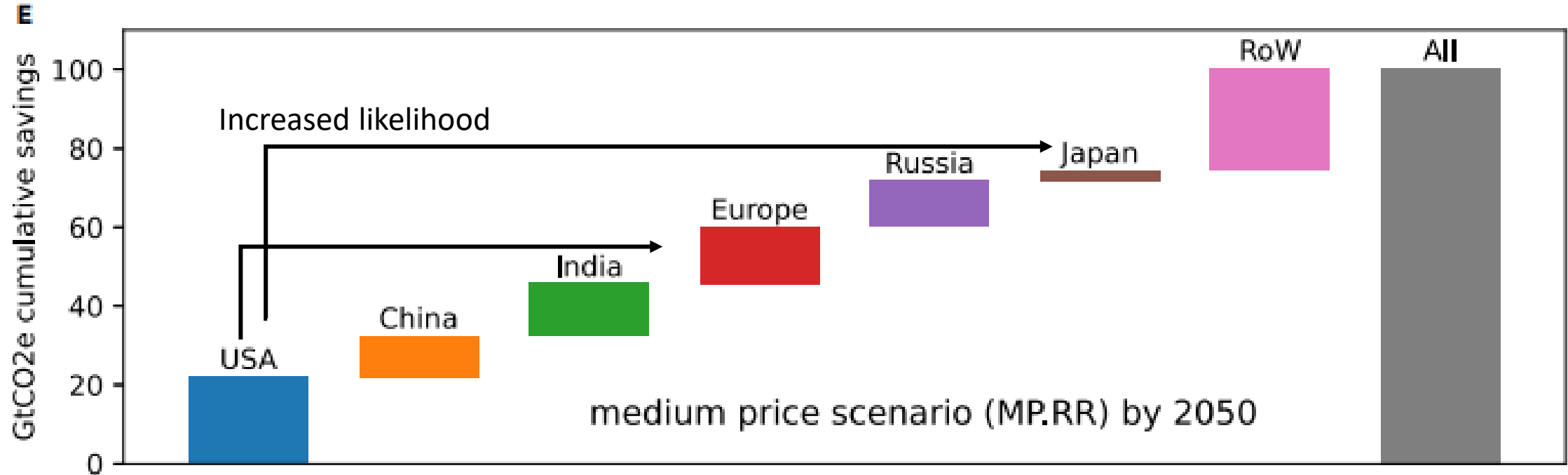
Oswald, Y., Owen, A., & Steinberger, J. K. (2020). Large inequality in international and intranational energy footprints between income groups and across consumption categories. *Nature Energy*, 5(3), 231-239.

Taxation of luxury emissions improves fairness of climate policy



Graph from:
Oswald, Y., Millward-Hopkins, J.,
Steinberger, J. K., Owen, A., &
Ivanova, D. (2023). Luxury-focused
carbon taxation improves fairness of
climate policy. *One Earth*, 6(7), 884-
898

The USA would be critical in introducing a luxury carbon tax, for impact and for leadership



Graph from:

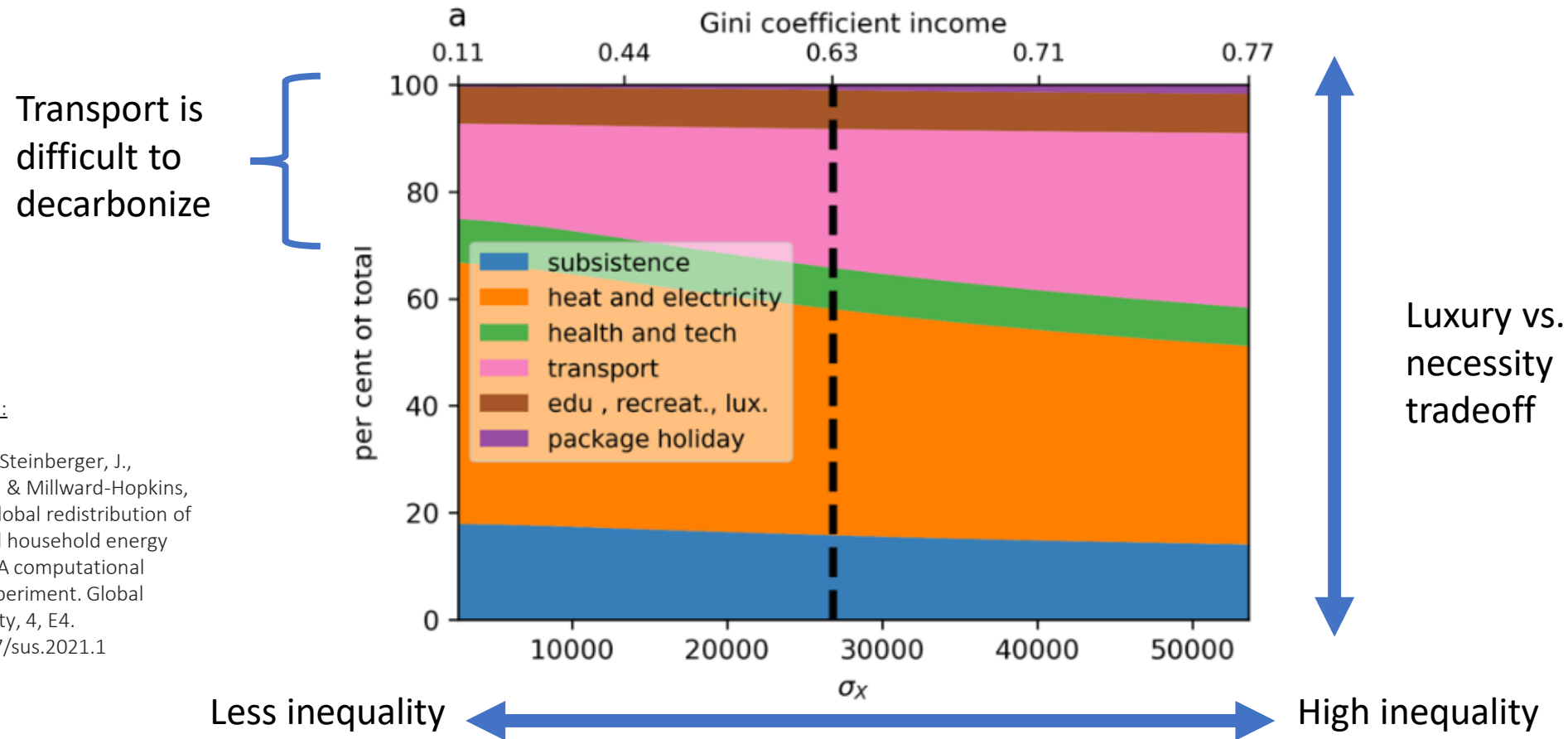
Oswald, Y., Millward-Hopkins, J., Steinberger, J. K., Owen, A., & Ivanova, D. (2023). Luxury-focused carbon taxation improves fairness of climate policy. *One Earth*, 6(7), 884-898.

On policy diffusion

Oswald, Y., Malleson, N., & Suchak, K. (2023). An agent-based model of the 2020 international policy diffusion in response to the COVID-19 pandemic with particle filter. *arXiv preprint arXiv:2302.11277*.

Linsenmeier, M., Mohommad, A. & Schwerhoff, G. Global benefits of the international diffusion of carbon pricing policies. *Nat. Clim. Chang.* **13**, 679–684 (2023). <https://doi.org/10.1038/s41558-023-01710-8>

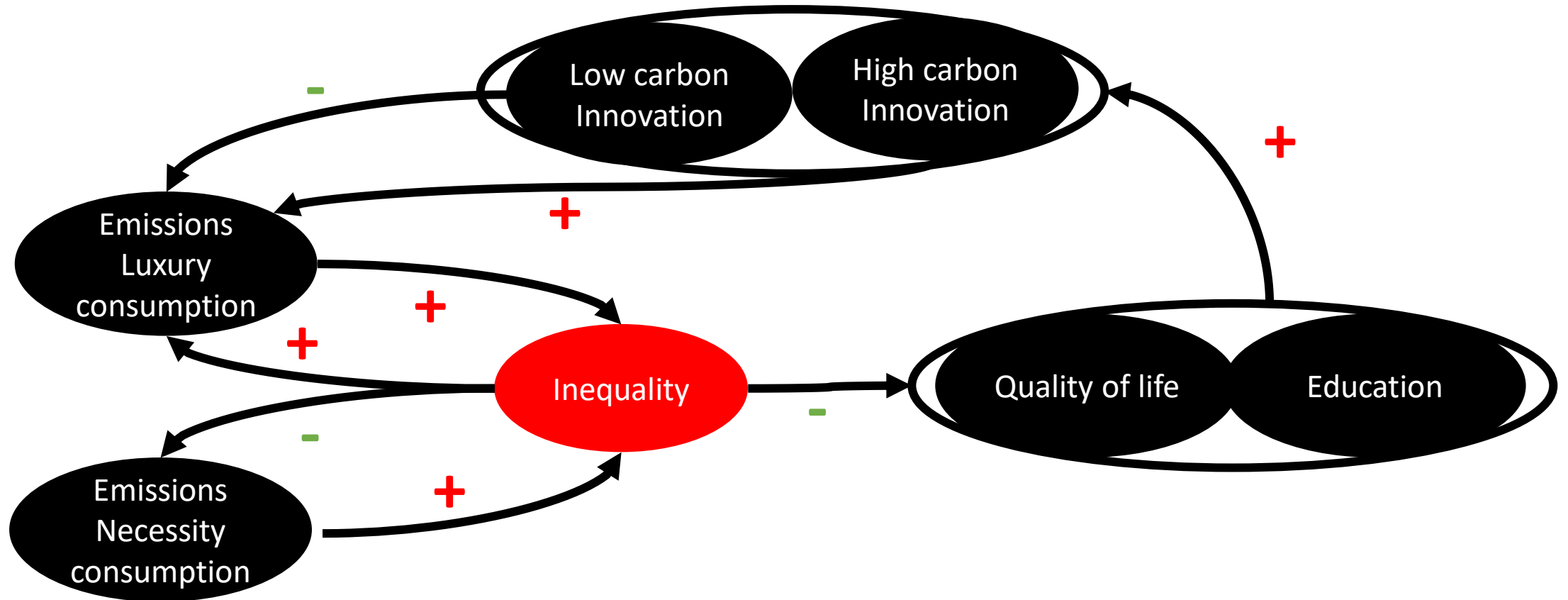
Why a more equal world would be easier to decarbonize (i)



Graph from:

Oswald, Y., Steinberger, J.,
Ivanova, D., & Millward-Hopkins,
J. (2021). Global redistribution of
income and household energy
footprints: A computational
thought experiment. Global
Sustainability, 4, E4.
doi:10.1017/sus.2021.1

Why a more equal world would be easier to decarbonize (ii) – or would it? Feedback picture



Postgrowth/Degrowth in a chaotic and dangerous world

Preliminary critical thoughts

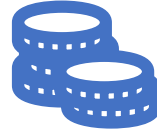
What is Post-growth/degrowth? (i)



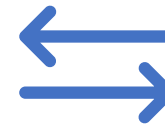
Abandon GDP as
success metric



Reduce resource
use



Anti-capitalism



Complete virtue
shift – idealist
philosophy



Perhaps, more
decentralized
government

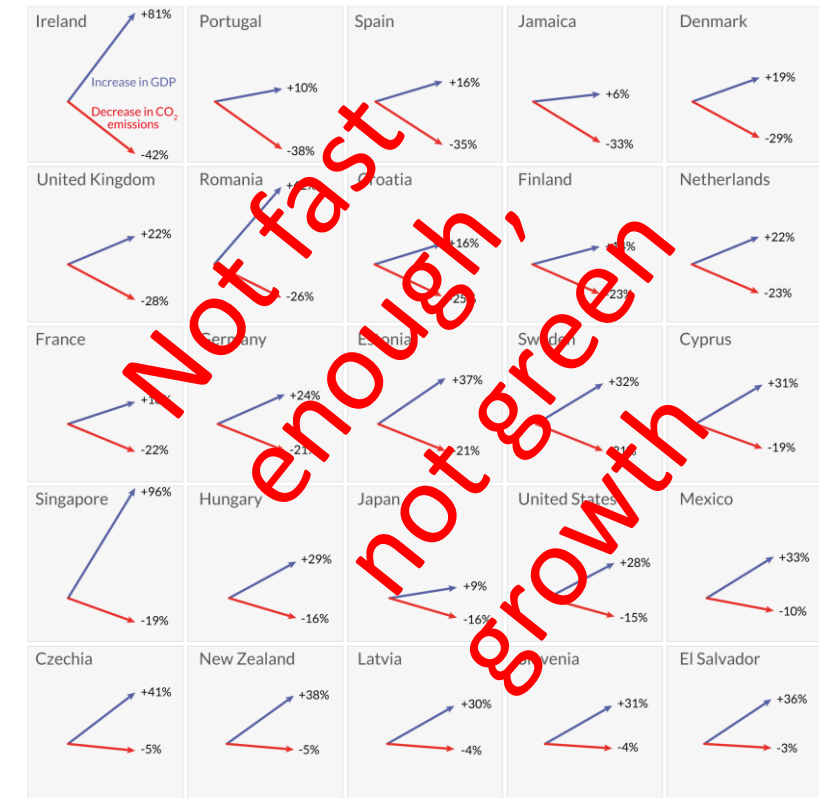
What is Post-growth/degrowth? (ii)

Currently mostly aimed at Global North

See also Vogel, J., & Hickel, J. (2023). Is green growth happening? An empirical analysis of achieved versus Paris-compliant CO₂–GDP decoupling in high-income countries. *The Lancet Planetary Health*, 7(9), e759-e769.

Decoupling: Countries that achieved **economic growth** while **reducing CO₂ emissions**, 2005–19 

Emissions are adjusted for trade. This means that CO₂ emissions caused in the production of imported goods are added to its domestic emissions – and for goods that are exported the emissions are subtracted.



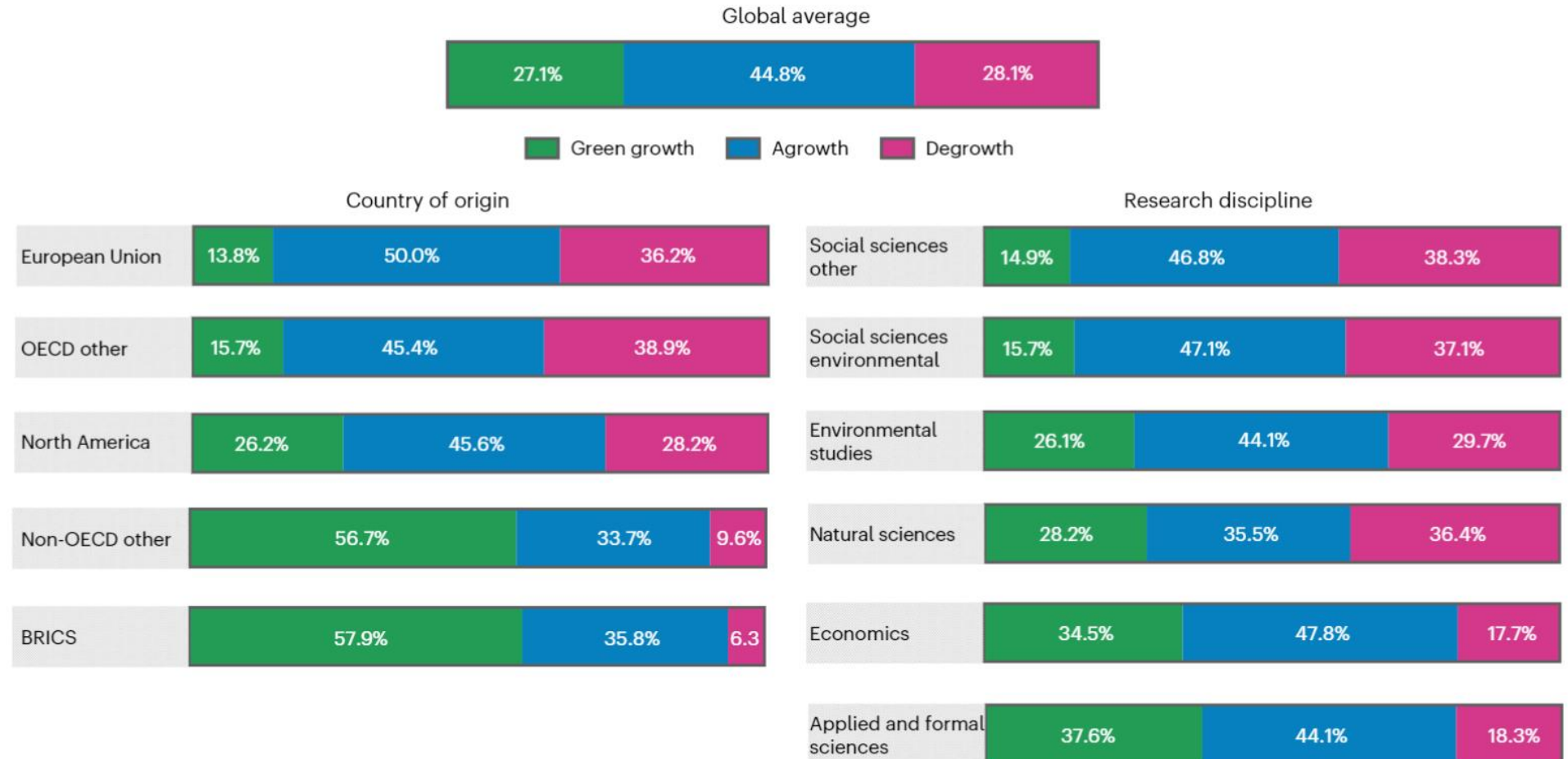
Data: Global Carbon Project & World Bank. There are more than these 25 countries that achieved the same. [OurWorldinData.org](https://ourworldindata.org) – Research and data to make progress against the world's largest problems.

Licensed under CC-BY by the author Max Roser

Now a significant portion of climate researchers believes in degrowth

Figure from

King, L.C., Savin, I. & Drews, S. Shades of green growth scepticism among climate policy researchers. *Nat Sustain* (2023).
<https://doi.org/10.1038/s41893-023-01198-2>



My view on post-growth/degrowth as an alternative to green growth in a chaotic world

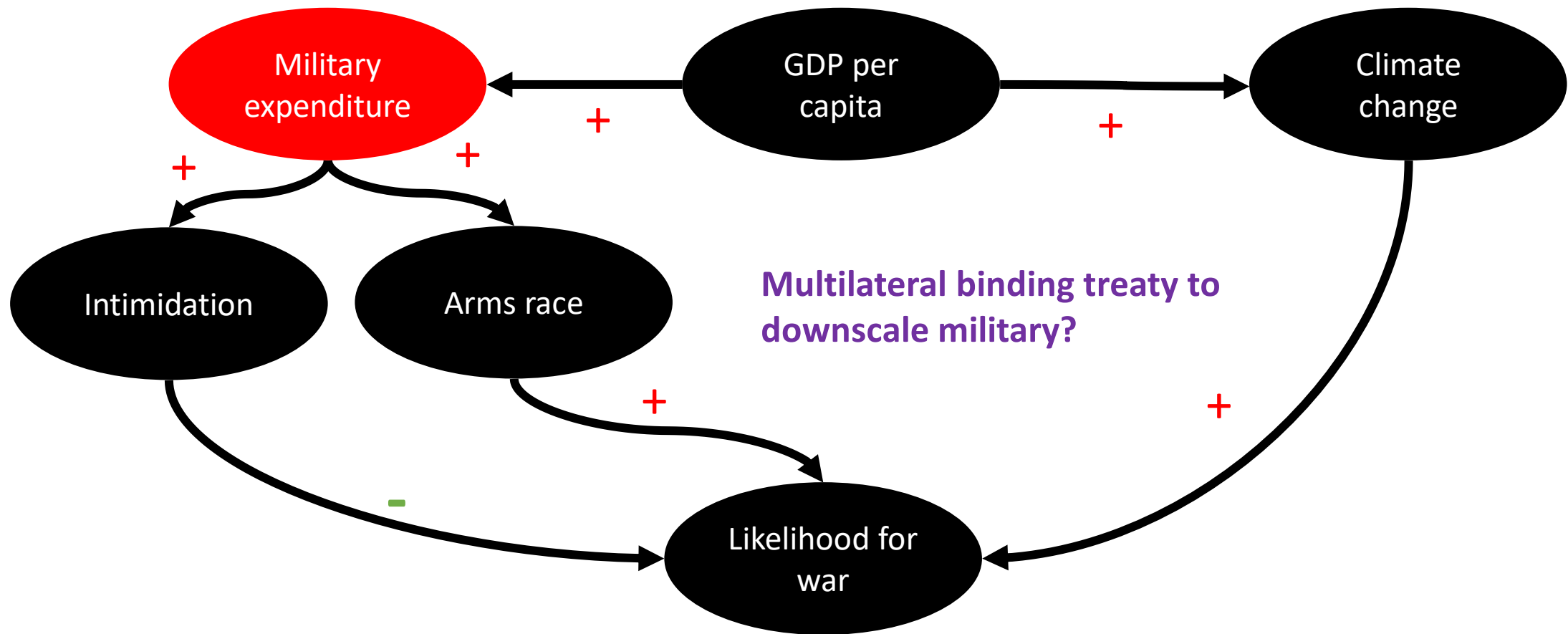


- Many goals, including global justice
- Asks many right questions
- Active movement for change



- Time feasibility
- Geopolitical constraints
- Political constraints
- The world is “full” of malicious actors

Geopolitical constraints example military power | partial picture..



Left out from talk but clearly important

- Fossil fuel industry
- Climate activism
- AI
- More detail on dangerous groups (crime, fascist parties, militants etc.)



Two quotes instead of a conclusion...

YUVAL NOAH HARARI

“The job of intellectuals, artists and scholars is to try and go deeper. To try and see the **complexity of reality**, especially in today’s climate of post-truth. It feels **intellectually and emotionally lazy** to just pick a side.”

@harari_yuval

“We must always take sides. Neutrality helps the oppressor, never the victim. Silence encourages the tormentor, never the tormented.”
— Elie Wiesel

End