

Living Well Within Planetary Limits: Is it possible? And what will it take?



Forum for
Macroeconomics and
Macroeconomic Policies

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What are you going to do?

10 basic facts for human & planetary survival

@jksteinberger

Physical, natural & technological sphere

Social, economic, cultural & political sphere

Diagnosis

① The climate & ecological crises are really, really bad.

⑥ Our economies & governments are responsible for these crises and perpetuate them.

Prognosis

② On our current trajectory, they will become much, much worse.

⑦ We should expect economically powerful forces to maintain our current trajectory.

Prevention

③ We can still, right now, prevent the climate & ecological crises from becoming cataclysmic.

⑧ We, the people, have the power to be a necessary counter-force to fossil-fuel industries & their corruption.

Treatment

④ This will require radical change: reducing the scale of consumption.

⑨ We must do this ourselves, working together. No one else will save us. We are all that stands between our world & destruction.

Outlook

⑤ This radical change is compatible with universal human well-being and healthier societies.

⑩ As engaged activists, we will build resilient, equitable and just societies, within planetary boundaries.

From understanding to action

- Urgency of climatic situation does not allow for gradualistic transitions (in research or reality), but calls for radical transformation.
- Popular movements (student strikes world-wide, Sunrise Movement in USA, Extinction Rebellion) all realise this.
- Is our research supporting them? How can we contribute and participate?



Outline

- Climate context
- Living Well Within Limits project
 - Is it possible? No and yes.
 - What will it take?

Implications for research & action?



26 August 2021, Impossible Rebellion, London

CLIMATE CONTEXT



We are doing this... ...our emissions need to do this.

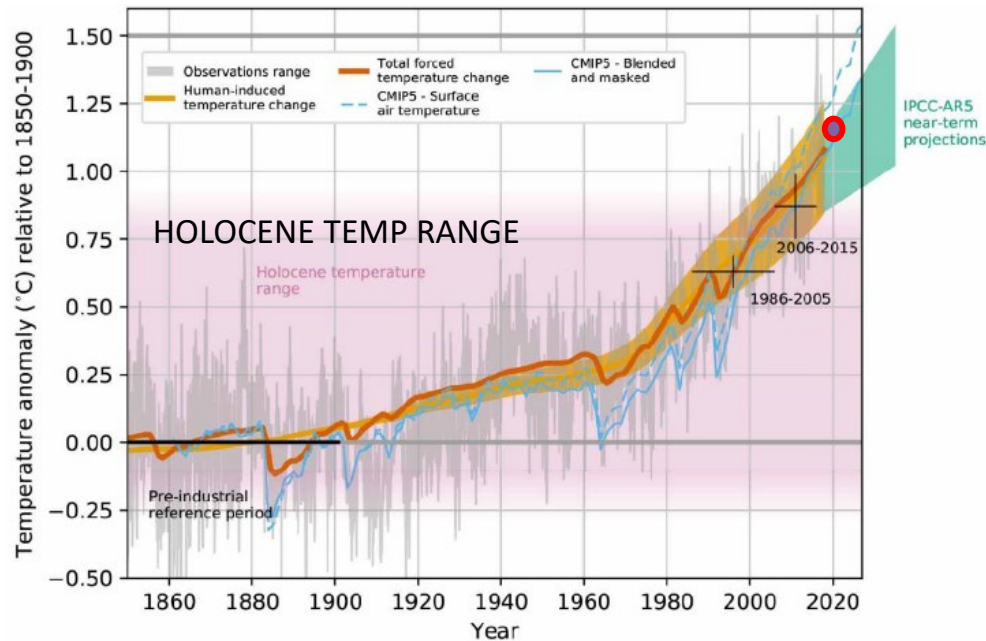
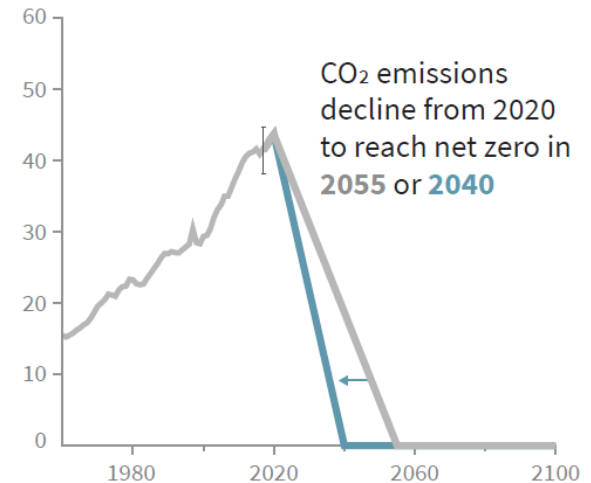


Figure 1.2: Evolution of global mean surface temperature (GMST) over the period of instrumental observations. Grey line shows monthly mean GMST in the HadCRUT4, NOAA, GISTEMP and

IPCC SR1.5

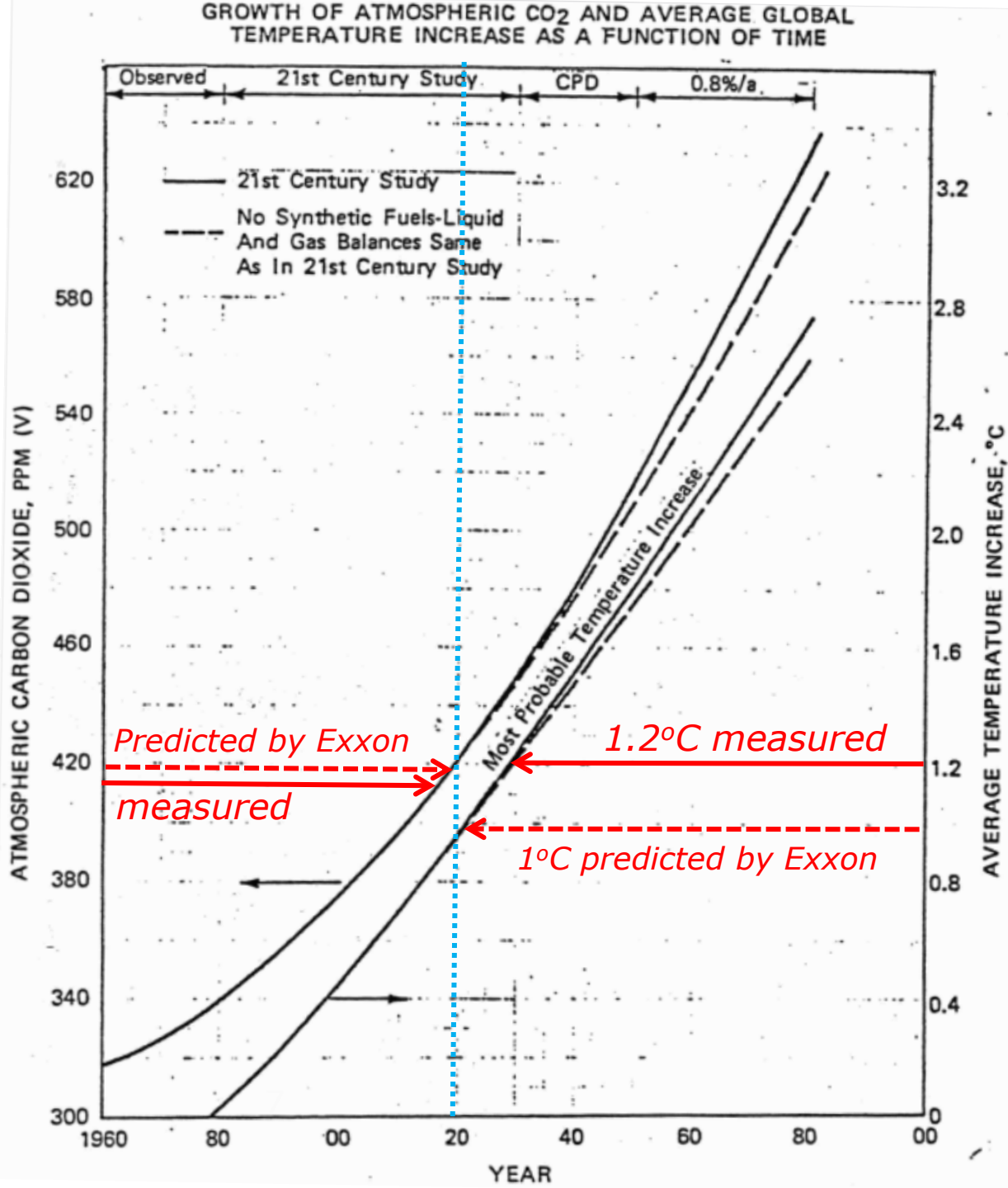
b) Stylized net global CO₂ emission pathways
Billion tonnes CO₂ per year (GtCO₂/yr)



CO₂ emissions decline from 2020 to reach net zero in 2055 or 2040

FASTER IMMEDIATE CO₂ EMISSION REDUCTIONS LIMIT CUMULATIVE CO₂ EMISSIONS SHOWN IN PANEL (c).

Who could possibly have known?



Exxon
internal
report,
1982

Implications

1. Urgent & large scale action is required (“Radical emission reductions”)
 - Getting to zero or close WITHIN next twenty years.
2. Fastest & surest way to do that is reduce consumption
 - Reducing consumption doesn’t require [as much] new technology or infrastructure.
3. But to date very little (no?) research into **how consumption could be reduced while preserving/enhancing well-being.**



“We haven’t even TRIED mitigation yet.”

Professor Kevin Anderson, University of Manchester

THE NEED FOR A NEW FRAMEWORK: THE LIVING WELL WITHIN LIMITS (LILI) PROJECT



The LiLi analytic framework

Living Well
Within
Limits [LiLi]

BIOPHYSICAL INPUTS

Planetary Processes

Hydrological cycle,
Carbon cycle,
Solar radiation,
Biodiversity,
Nitrogen cycle,
Etc.

Natural Resources

Energy,
Materials,
Land,
Water,
Etc.

PROVISIONING SYSTEMS

Physical

Infrastructure,
Technology,
Land use,
Supply Chains.

Social

State,
Markets,
Communities,
Institutions,
Norms,
Culture,
Distribution.

SOCIAL OUTCOMES

Need satisfiers

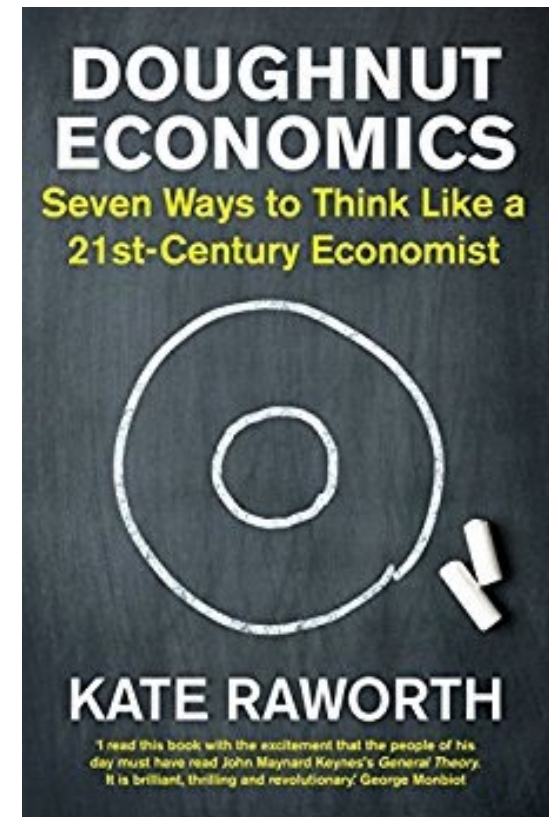
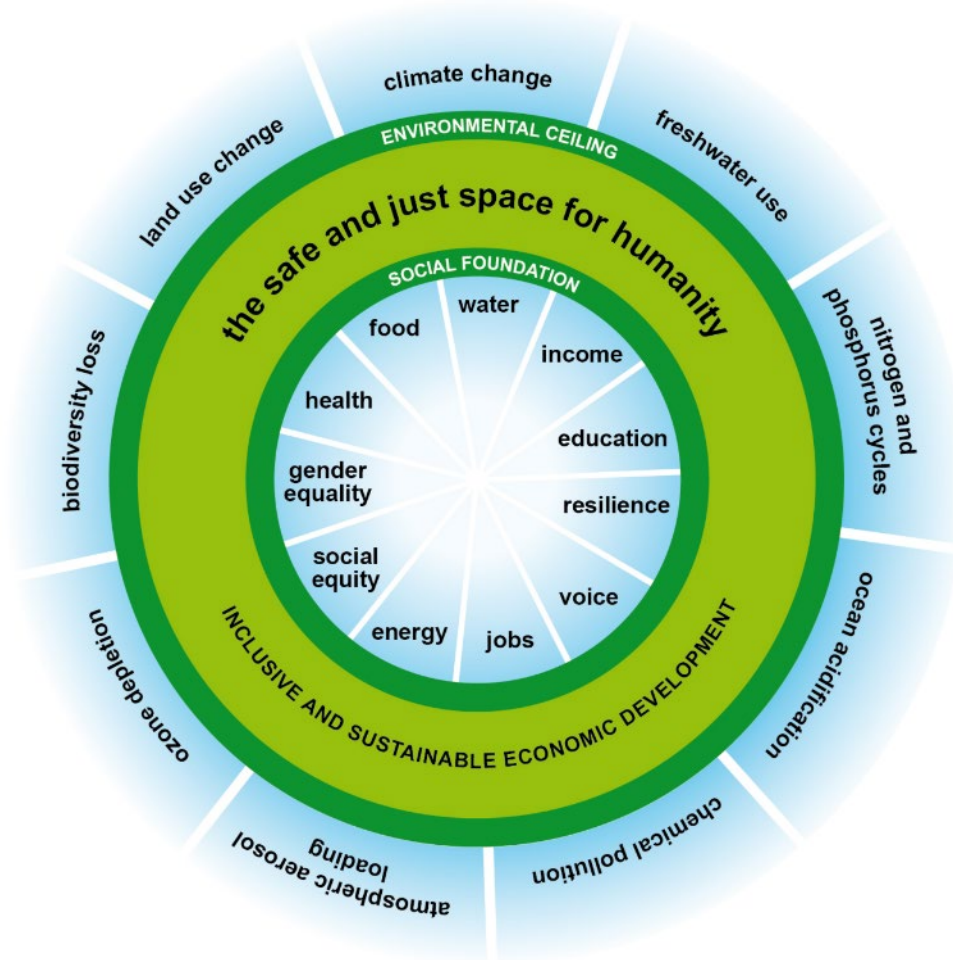
Food & water,
Housing,
Healthcare,
Education,
Relationships,
Economic security,
Physical safety,
Childhood safety,
Safe birth control & childbearing.

Well-being

Physical & mental health,
Autonomy of agency,
Cognitive understanding,
Social participation,
Life satisfaction,
Etc.

Is it possible to live well within limits?

Testing Kate Raworth's Doughnut.

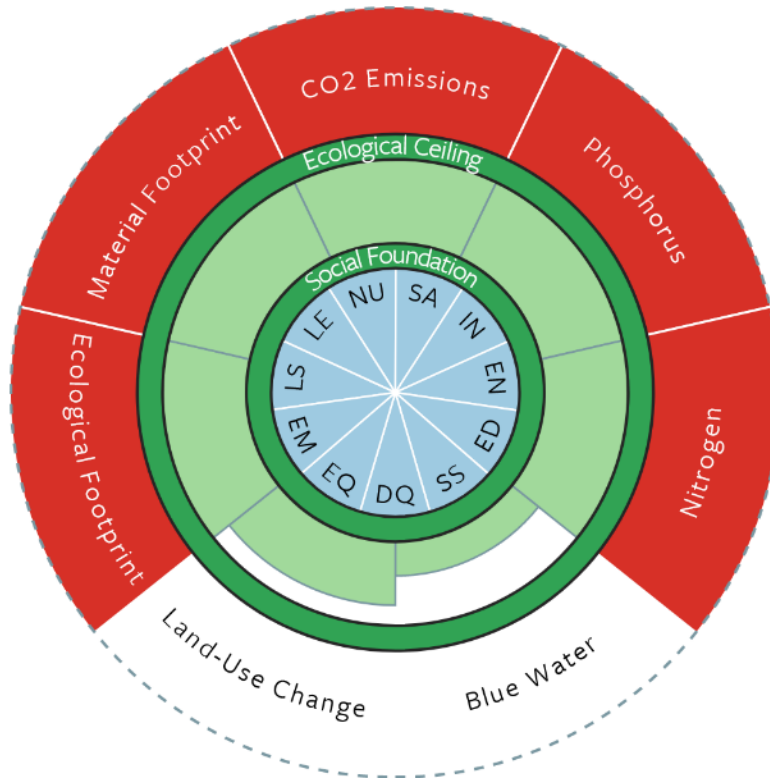




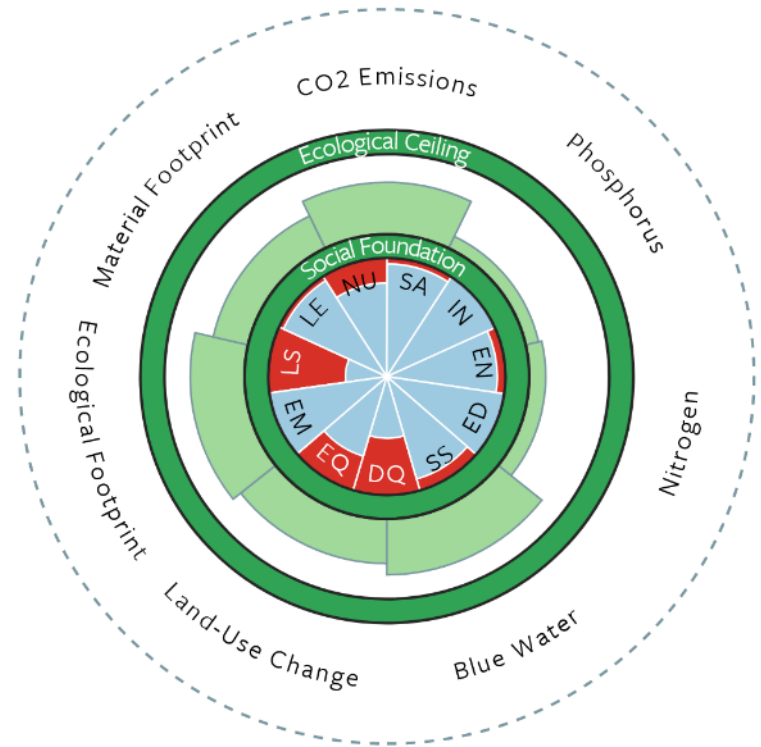
LiLi

National results

Germany

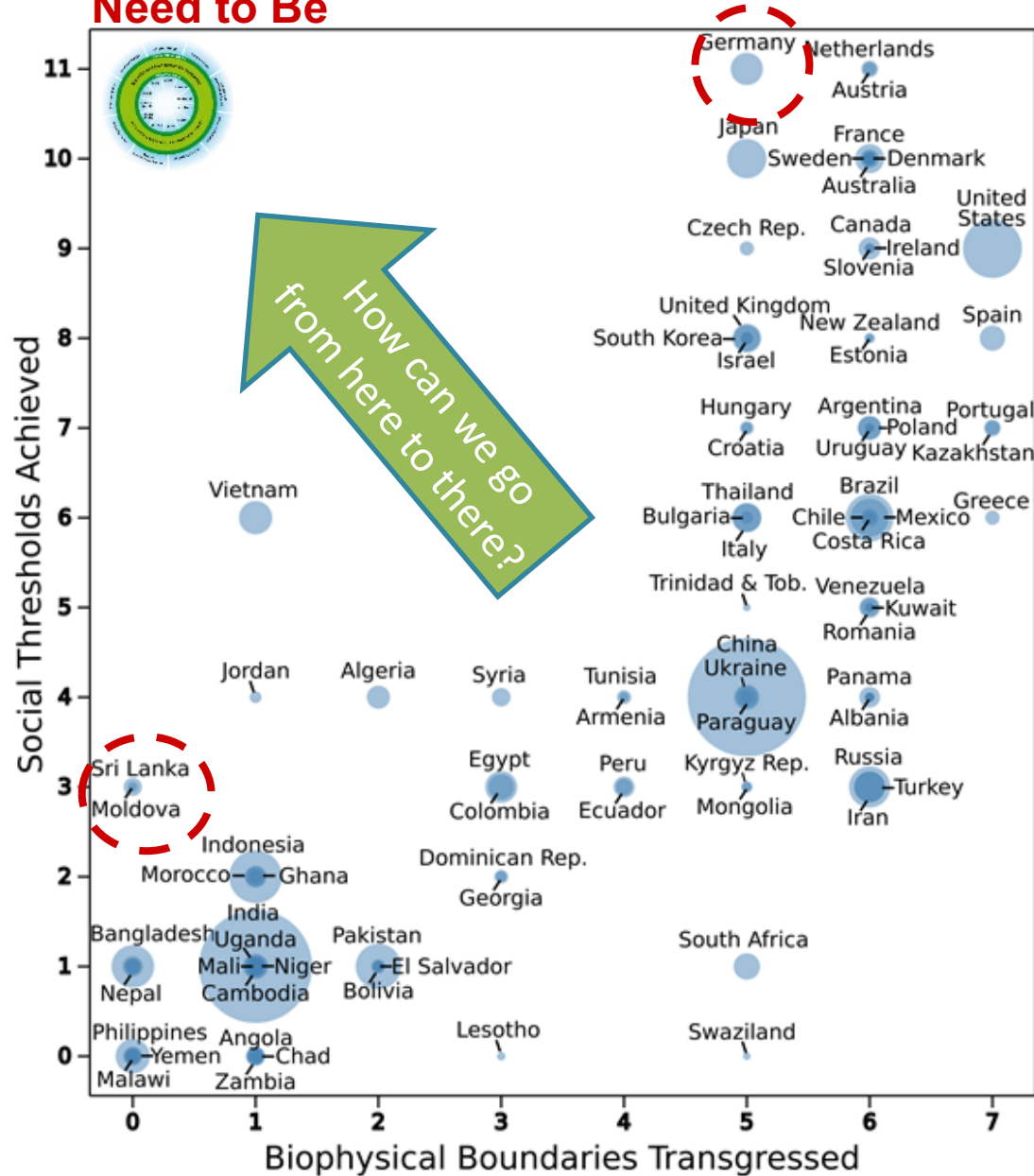


Sri Lanka



LS	Life Satisfaction	IN	Income	DQ	Democratic Quality
LE	Healthy Life Expectancy	EN	Access to Energy	EQ	Equality
NU	Nutrition	ED	Education	EM	Employment
SA	Sanitation	SS	Social Support		

Where We Need to Be



<https://goodlife.leeds.ac.uk>

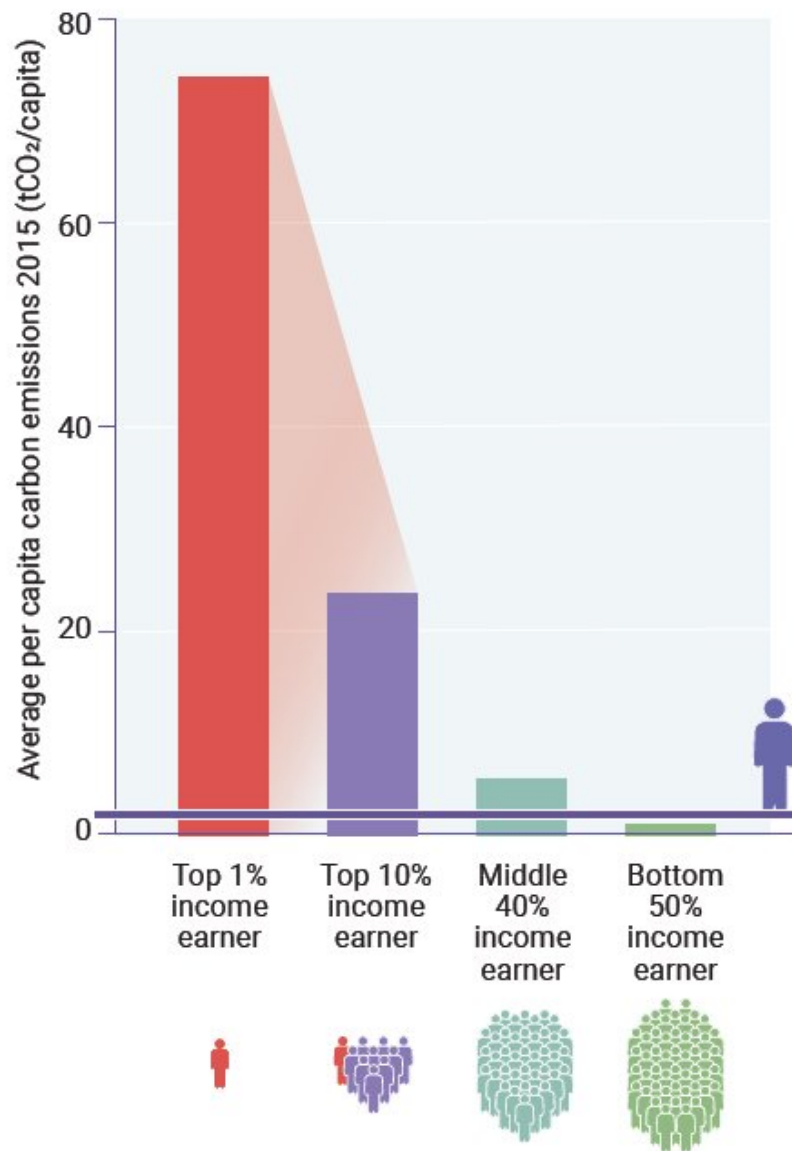
**Question: Is it
possible to live well
within limits?**

**Answer: No.
Not in current
international
reality.**

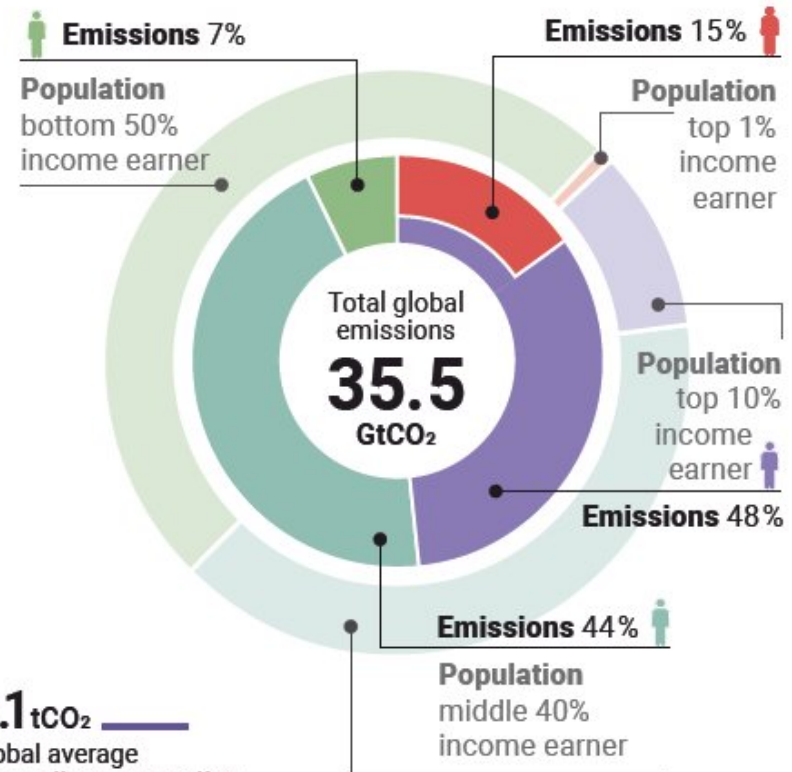
Can we find out how to get inside Kate Raworth's Doughnut?



Part 1: Equity & distribution




Total carbon emissions per group 2015 (GtCO₂)



2.1 tCO₂
Global average per capita consumption emissions target by 2030 for 1.5°C

Emissions Gap Report 2020

Scientists' warning on affluence

Thomas Wiedmann , Manfred Lenzen, Lorenz T. Keyßer & Julia K. Steinberger

Nature Communications **11**, Article number: 3107 (2020) | [Cite this article](#)




118k Accesses | **17** Citations | **4008** Altmetric | [Metrics](#)

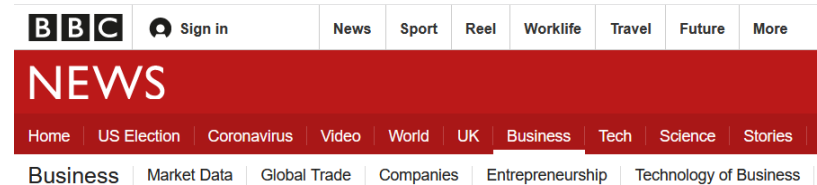
- Overconsumption is designed in by states, industries and markets (necessary as outlet for growth: lack of low-consumption alternatives, advertising etc).
- Positional consumption: the affluent drive consumption norms and aspirations.
- Existence & survival in unequal neoliberal economies compels overconsumption (private vehicles, time saving appliances)

International and intranational inequality in energy use



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

Yannick Oswald , Anne Owen  and Julia K. Steinberger 

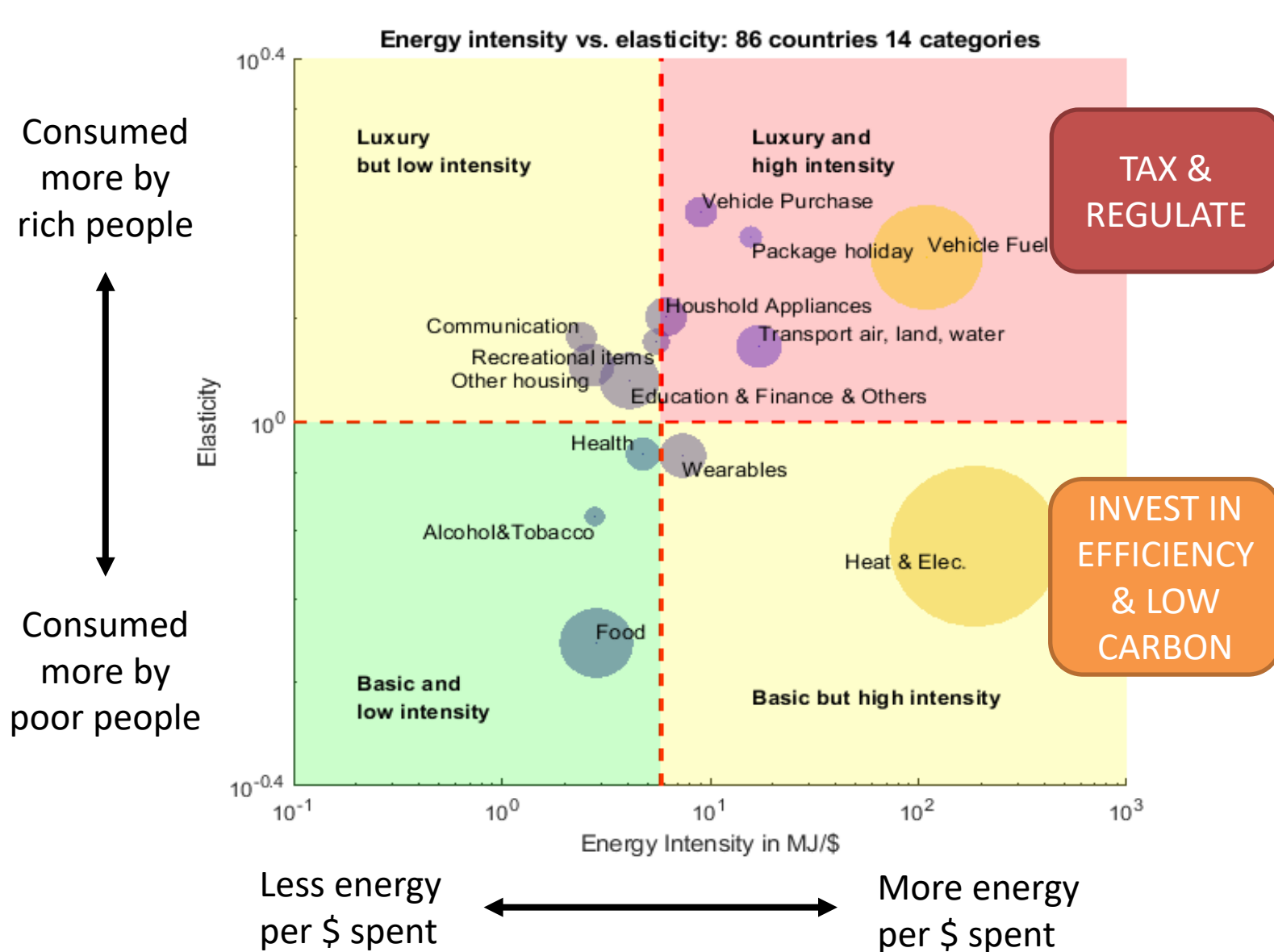


Climate change: The rich are to blame, international study finds

By Roger Harrabin
BBC environment analyst

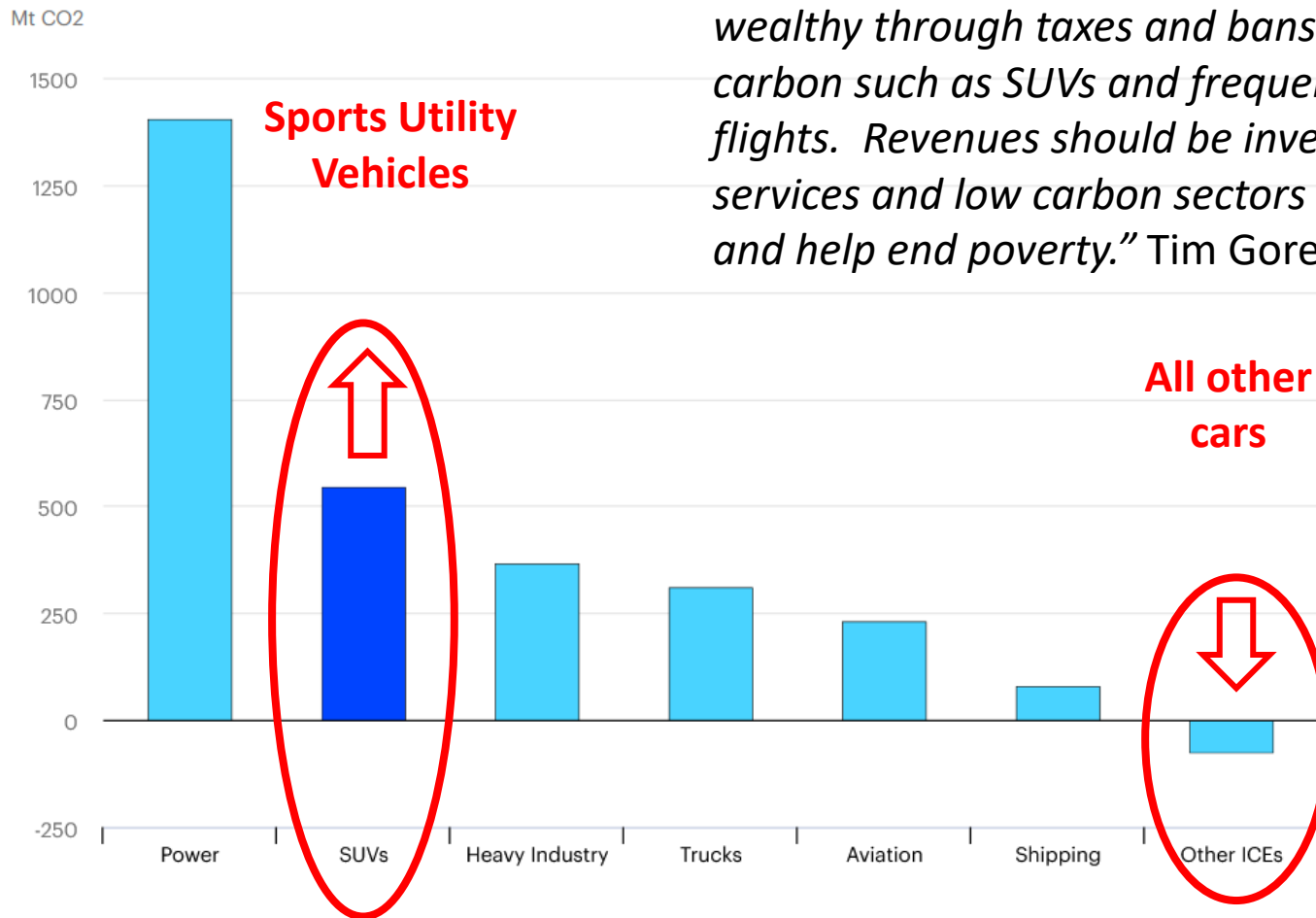
- Measure direct and indirect **energy footprints**
- Using Environmentally-Extended Multi-Regional **Input-Output** (EE-MRIO)
- For different **categories of products** based on expenditure.
- In **86 countries** (EU & World Bank)
- Divided into **income classes**.

Mapping product categories



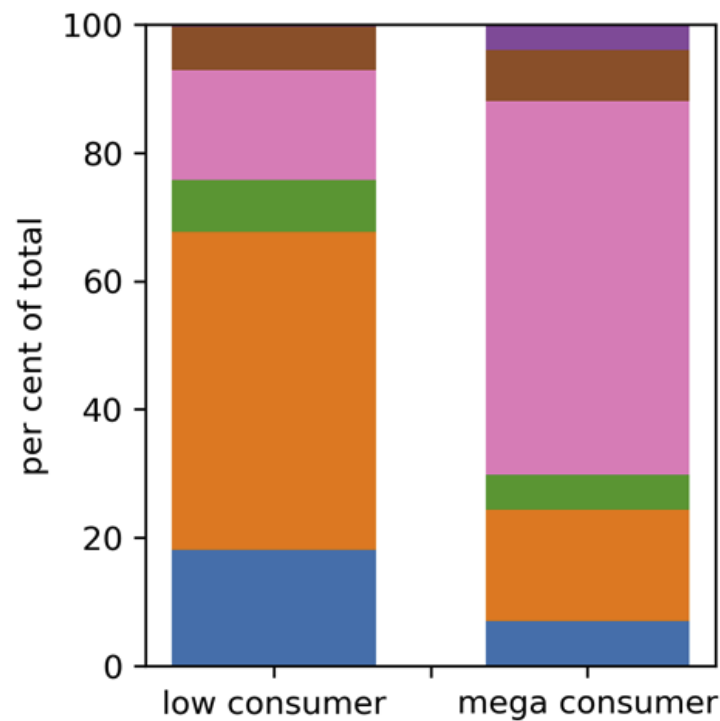
Car transport increasingly drives climate breakdown

Change in global CO2 emissions by energy sector, 2010-2018



"Governments must curb the emissions of the wealthy through taxes and bans on luxury carbon such as SUVs and frequent flights. Revenues should be invested in in public services and low carbon sectors to create jobs, and help end poverty." Tim Gore, Oxfam

Cozzi & Petropoulos, IEA, 2019



Redistribution would be beneficial.

Oswald et al 2021

THE CONVERSATION

Academic rigour, journalistic flair

Why a more equal world would be easier to decarbonise

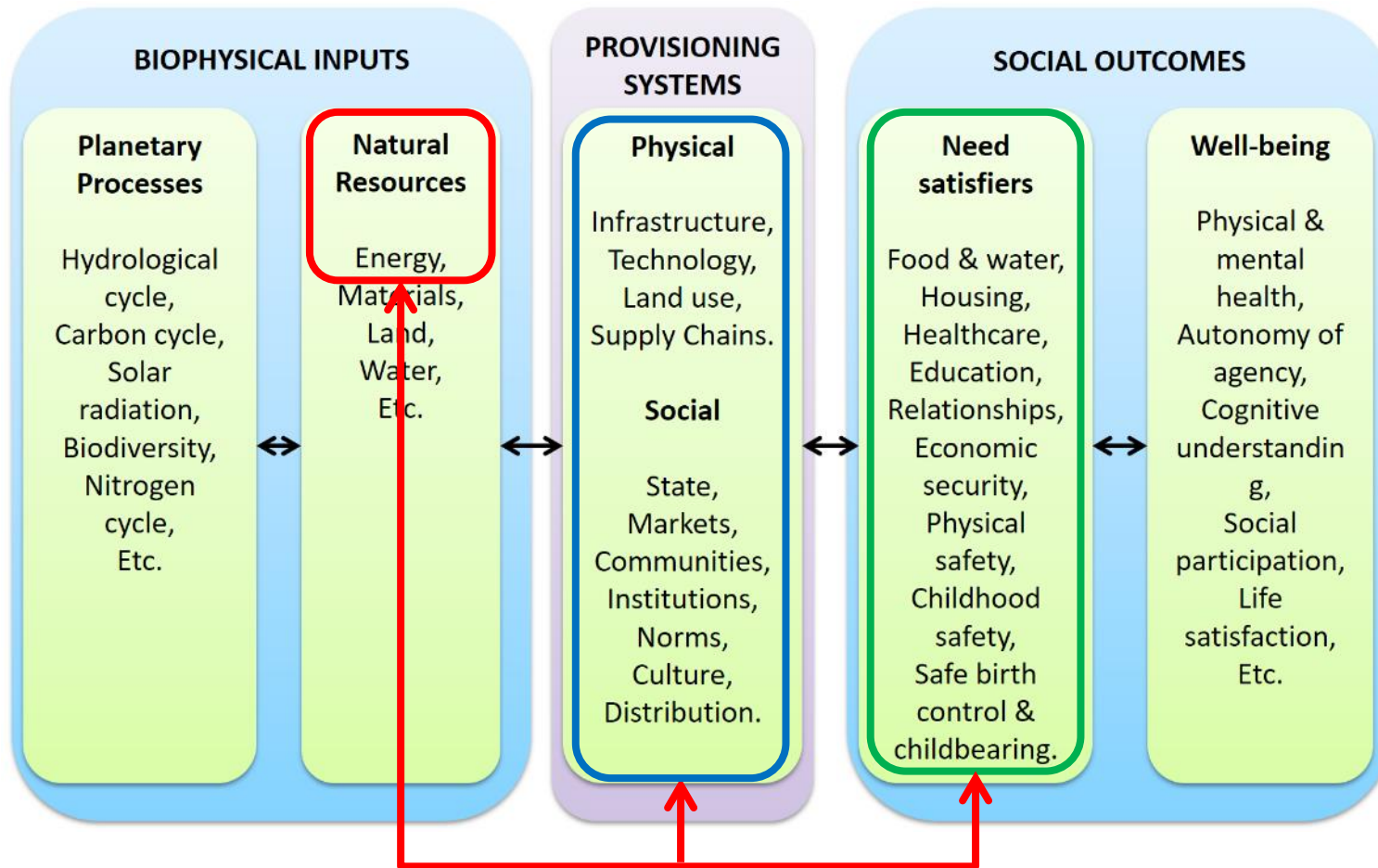
March 8, 2021 2:36pm GMT

Can we find out how to get inside Kate Raworth's Doughnut?



Part 2: Socio-economic factors

International energy demand vs well-being: what are mediating factors?



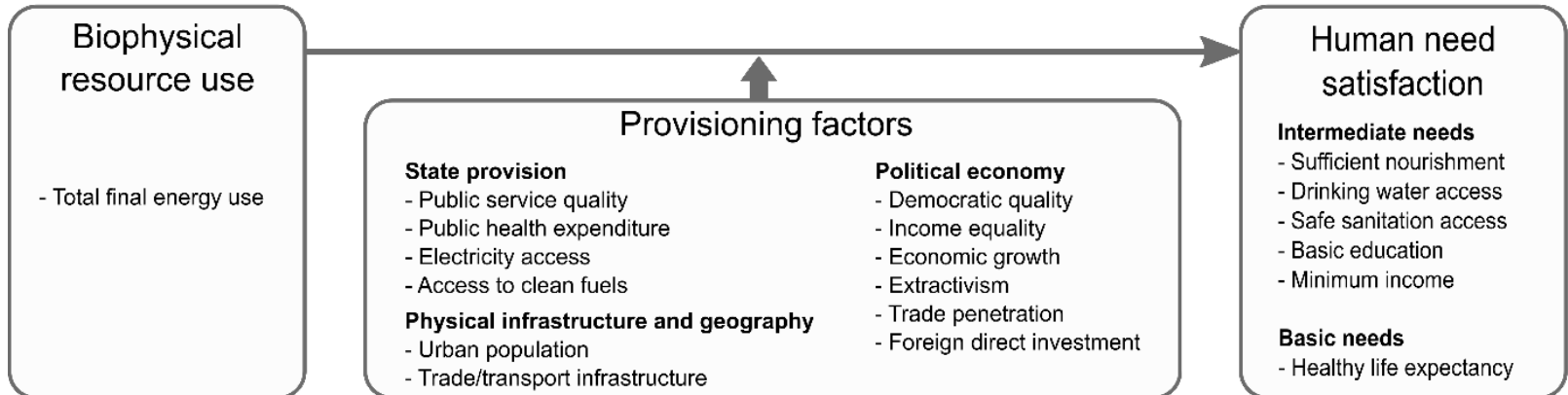
$$NS_{i,c} = a + b_1 ENU_{j,c}$$

Need
satisfaction

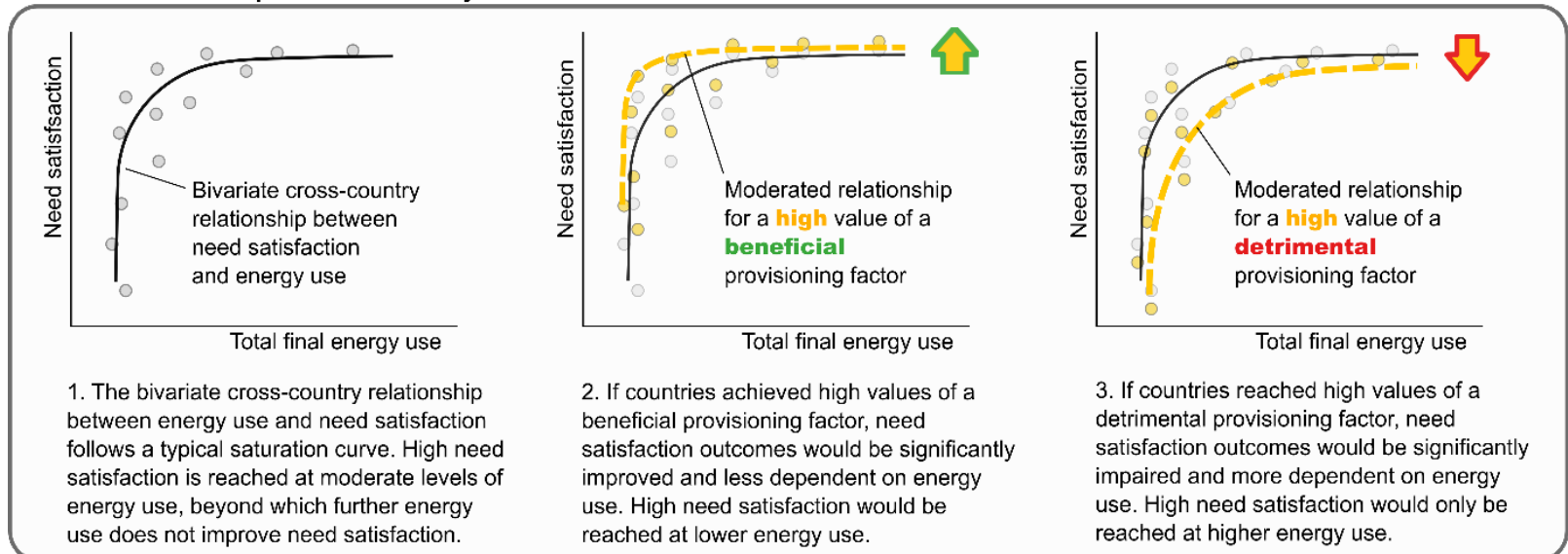
Energy
use

International energy demand vs well-being: what are mediating factors?

A. Analytical framework



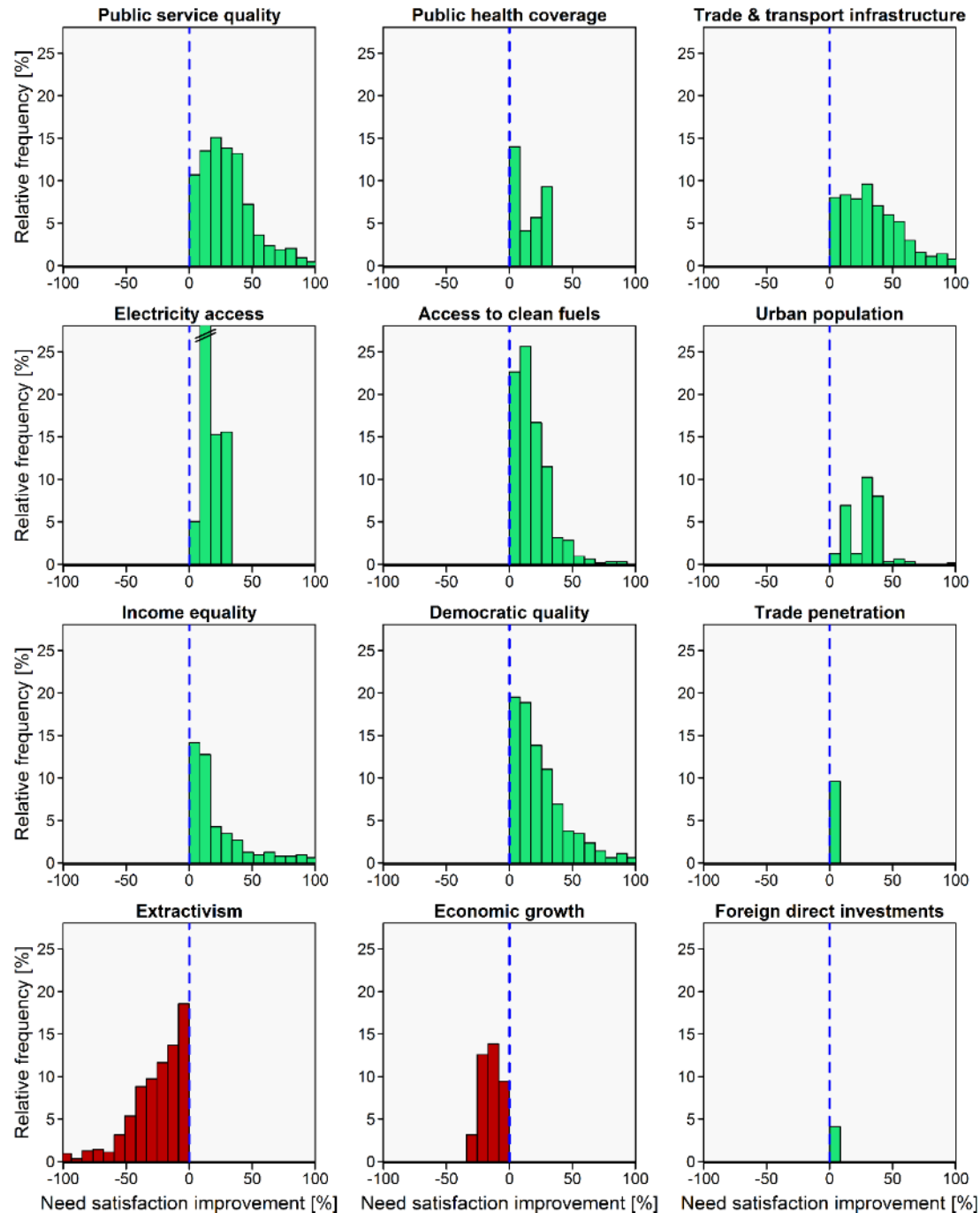
B. Qualitative depiction of analysis



Results

Which provisioning factors have positive effects?

Which are negative?



Can we find out how to get inside Kate Raworth's Doughnut?

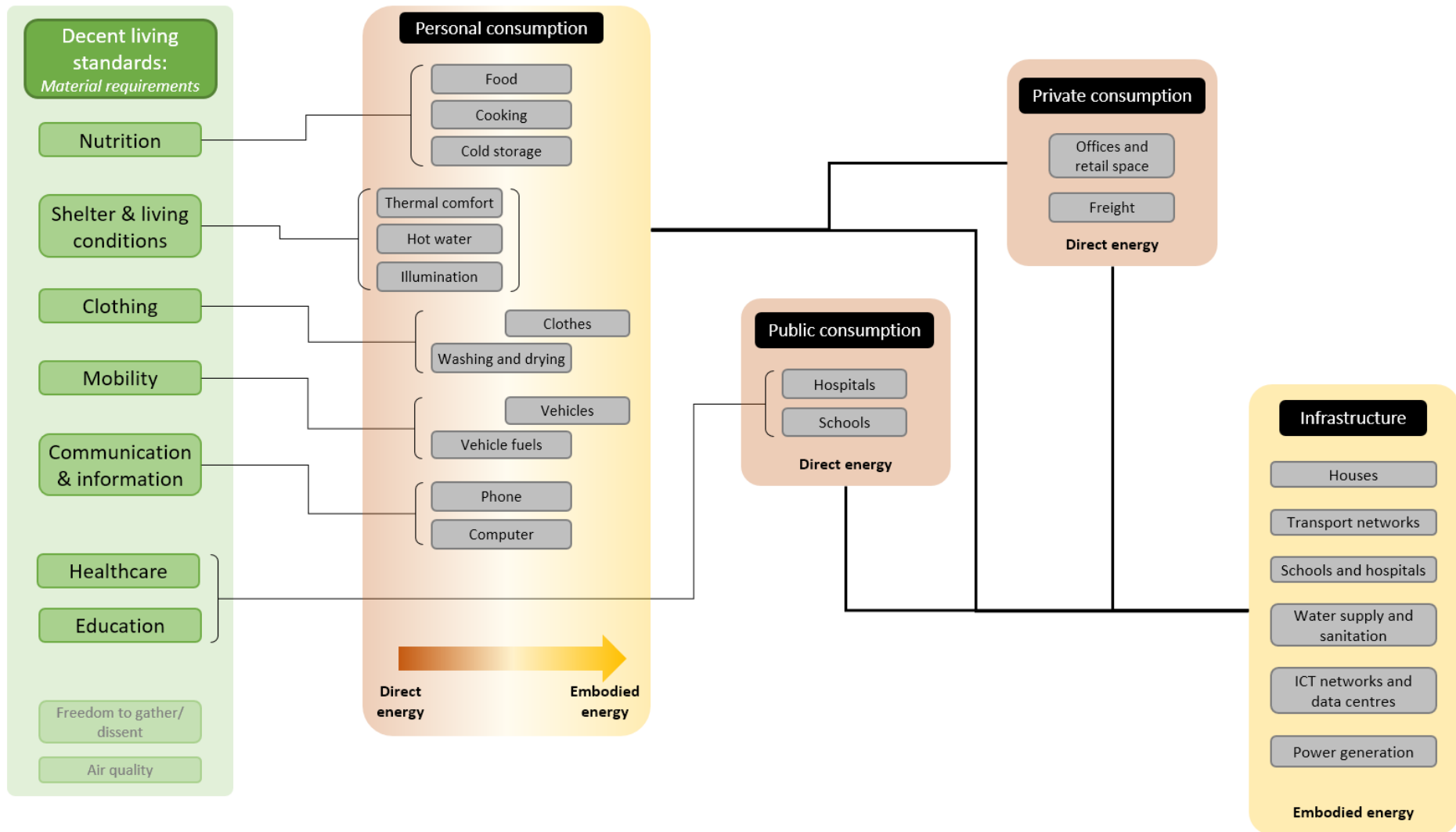


Part 3: Sufficiency & Efficiency Modelling

Can we model a different future?

- Based on the “Decent Living Energy” framework of Professor Narasimha Rao, Yale.
- Connects needs to sufficient levels of energy services.
- Global model takes into account technology improvements, equal distribution, result in lower demand levels.

What the model looks like, and takes into account

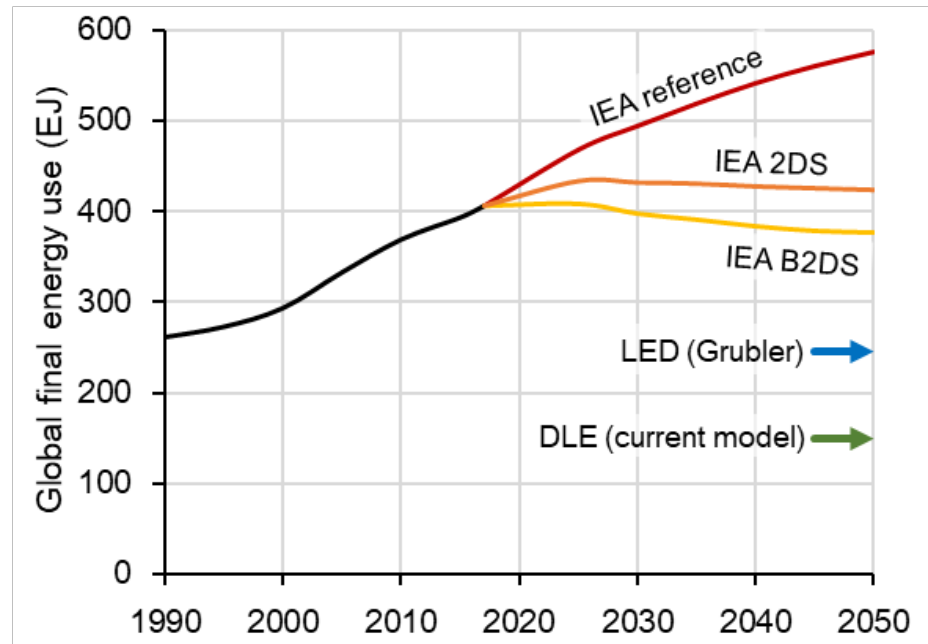


Sufficient energy for each person

Energy service	Level per person	Depends on ...
Nutrition	2000–2150 kcal/day	Demography
Living space heated or cooled to 20 degrees year round	15 m ² per person	Rural-urban Climate
Clean water	50 liters, of which 20 heated	
Communication	1 mobile phone per person 1 laptop per household	
Mobility	5'000 - 15'000 km/year	Rural-urban
Health	8 hospital beds per 1000 persons	
Education	5-19 year-olds in school	Demography

And the embodied energy in appliances, infrastructure, etc.

Global decent living energy results



Decent Living Energy for all achievable at 40% of current energy use, despite population growth until 2050.

Question: Is it possible to live well within limits?

Answer: Yes, but only through a complete transformation of our economic systems: towards

- 1. equity,**
- 2. sufficiency and**
- 3. maximal efficiency.**

From analysis to rebellion

nature
ecology & evolution



Credit: Louise Gardner



Credit: Alfredo Romero-Muñoz

Scientists must act on our own warnings to humanity

We face interconnected planetary emergencies threatening our climate and ecosystems. Charlie J. Gardner and Claire F. R. Wordley argue that scientists should join civil disobedience movements to fight these unprecedented crises.

“The scientists who alerted the world to the climate and ecological crises have a moral duty to join the popular movements demanding political action.”

ENVIRONMENT OCTOBER 13, 2019 / 3:09 AM / 3 DAYS AGO

Scientists endorse mass civil disobedience to force climate action

Matthew Green

5 MIN READ



LONDON (Reuters) - Almost 400 scientists have endorsed a civil disobedience campaign aimed at forcing governments to take rapid action to tackle climate change, with failure could inflict “incalculable human suffering.”

From Publications to Public Actions: The Role of Universities in Facilitating Academic Advocacy and Activism in the Climate and Ecological Emergency

Charlie J. Gardner^{1*}, Aaron Thierry², William Rowlandson³ and Julia K. Steinberger⁴

Environment protest being criminalised around world, say experts

More than 400 climate scientists sign letter that says activists are being targeted at pivotal time in fight against global heating

“It has become abundantly clear that governments don’t act on climate without pressure from civil society: threatening and silencing activists thus seems to be a new form of anti-democratic refusal to act on climate.”

Thanks! Any questions?

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