Social outcomes of energy use in the United Kingdom: Household energy footprints and their links to well-being

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CRESR Seminar: Why is it so hard to consume less? Unpicking high consumption and the factors locking it in

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Outline

- Motivation
- Data and Methods
- RESULTS: EF distribution
- RESULTS: EF composition
- RESULTS: EF & well-being
- Implications of the study

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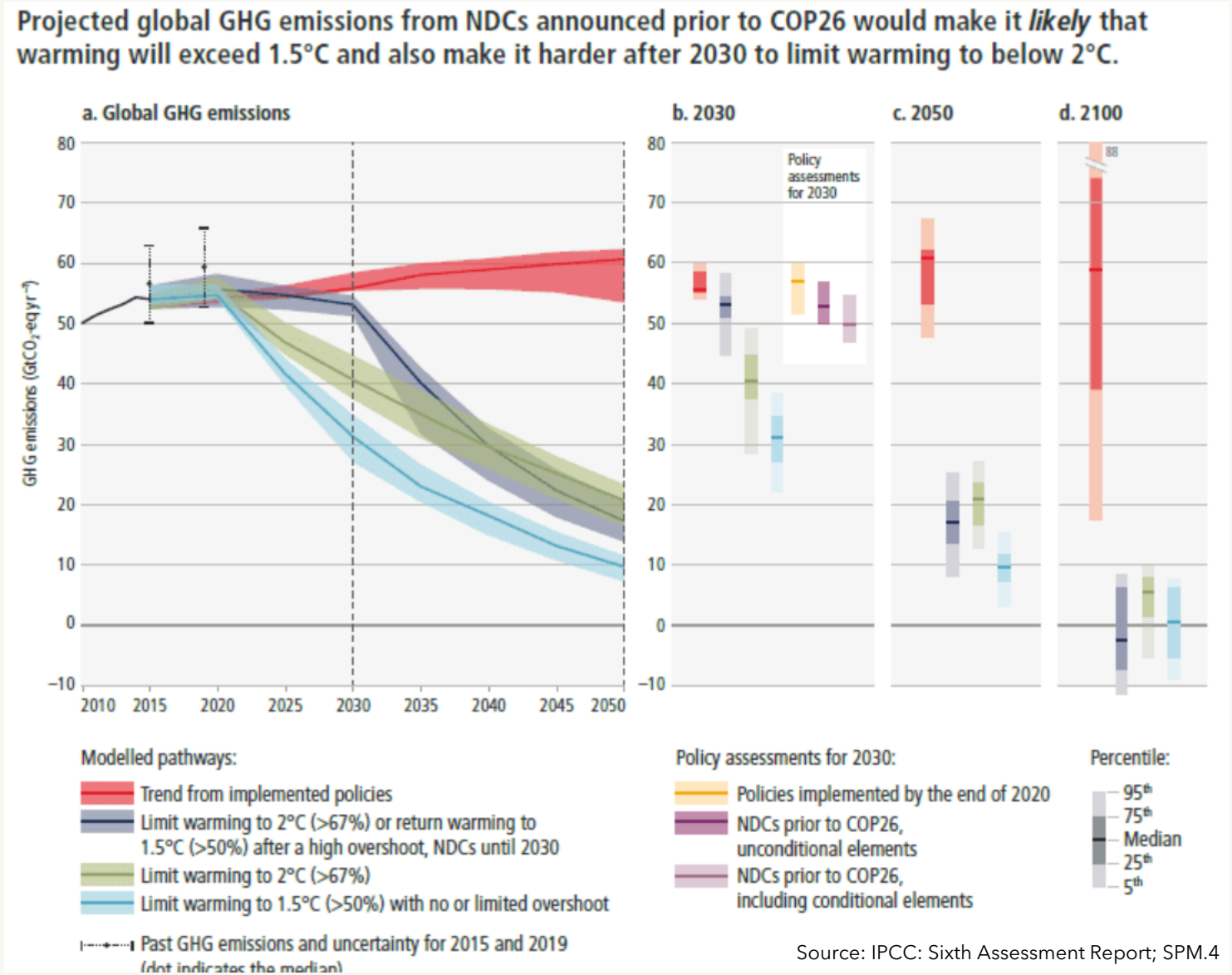
Motivation



Source: IPCC: Sixth Assessment Report; SPM.4

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Research Questions

How energy facilitates human need satisfaction, for whom, and with what well-being outcomes?

Aims:

- Investigate in detail the distribution, levels, and types of energy use
- Identify the most important characteristics of households with low and high well-being.

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Data

- **Understanding Society** (wave 10, 2018-2020) – UK household Longitudinal Study (1991 – ongoing)
- **Living cost and food survey (LCFS), 2019**
- **Final energy use International Energy Agency (IEA)**
- **UK Multiregional input-output database**

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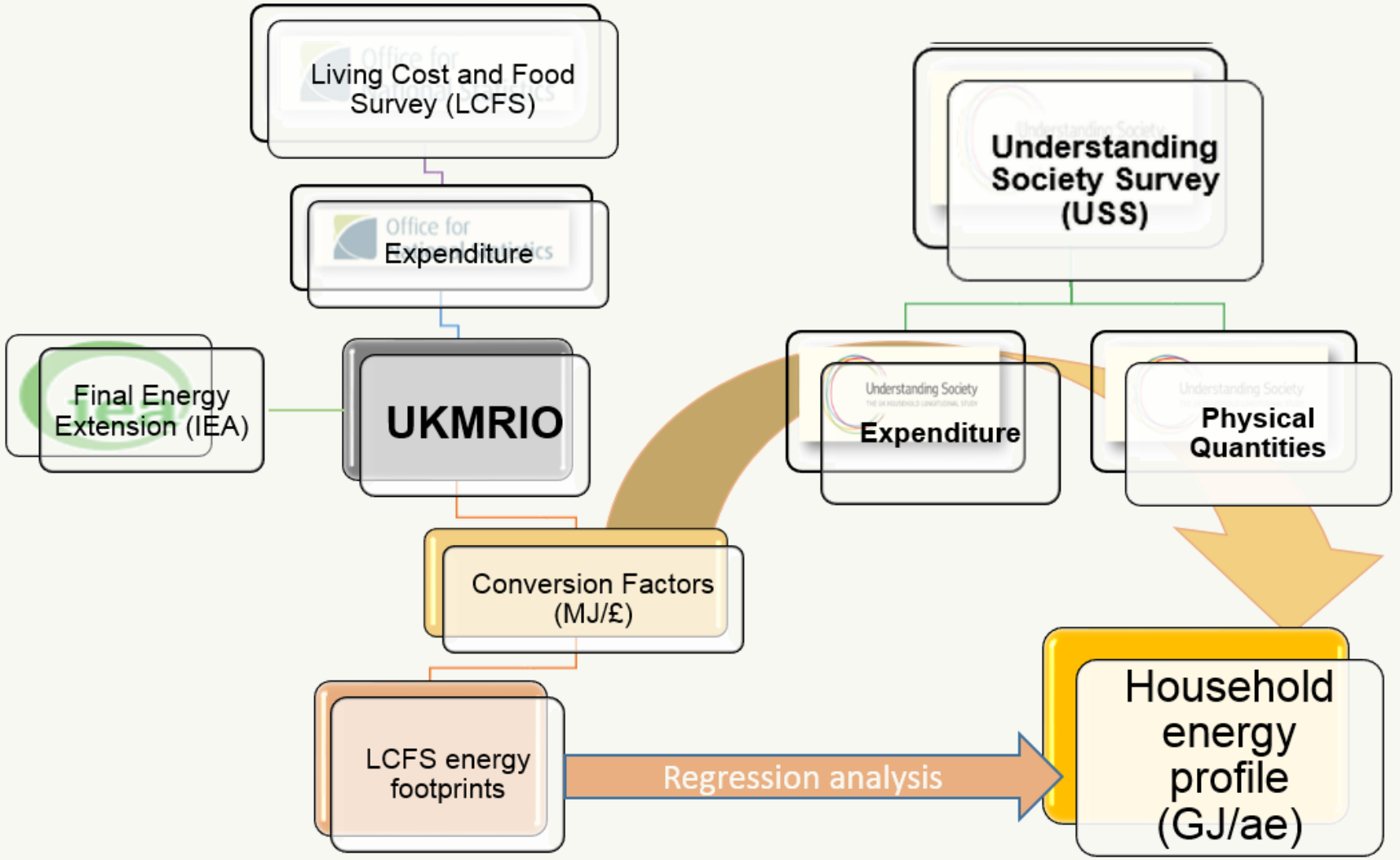
Methods



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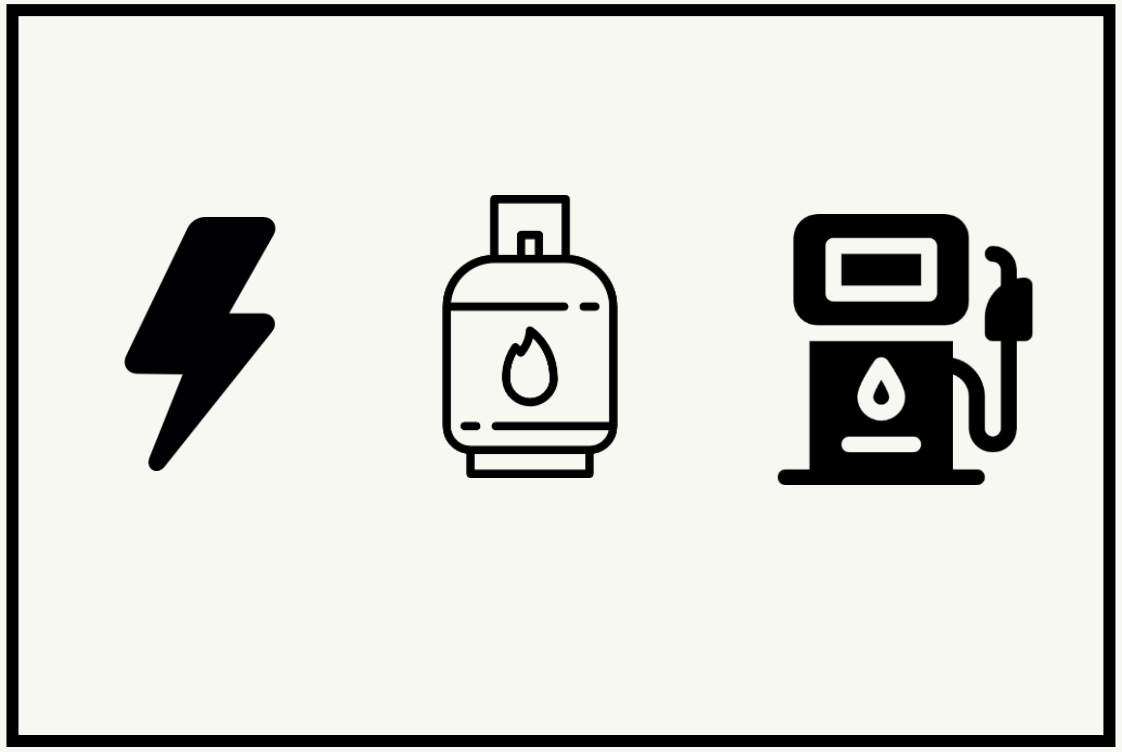
Energy Footprint dictionary

Direct



Indirect

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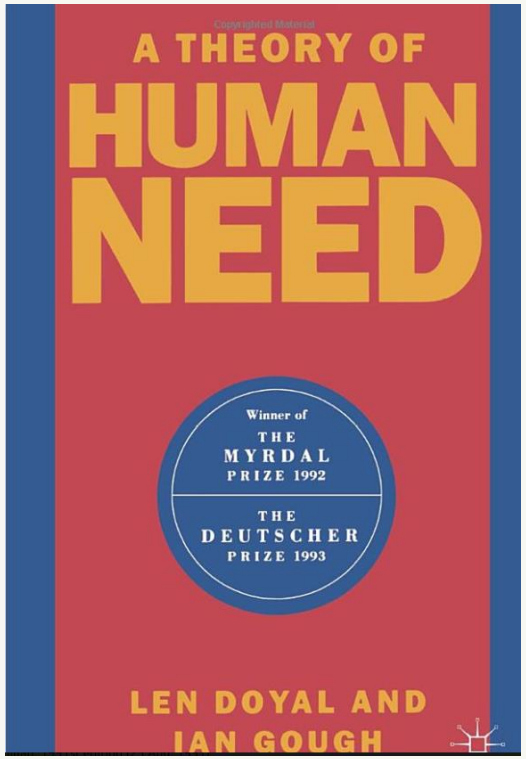
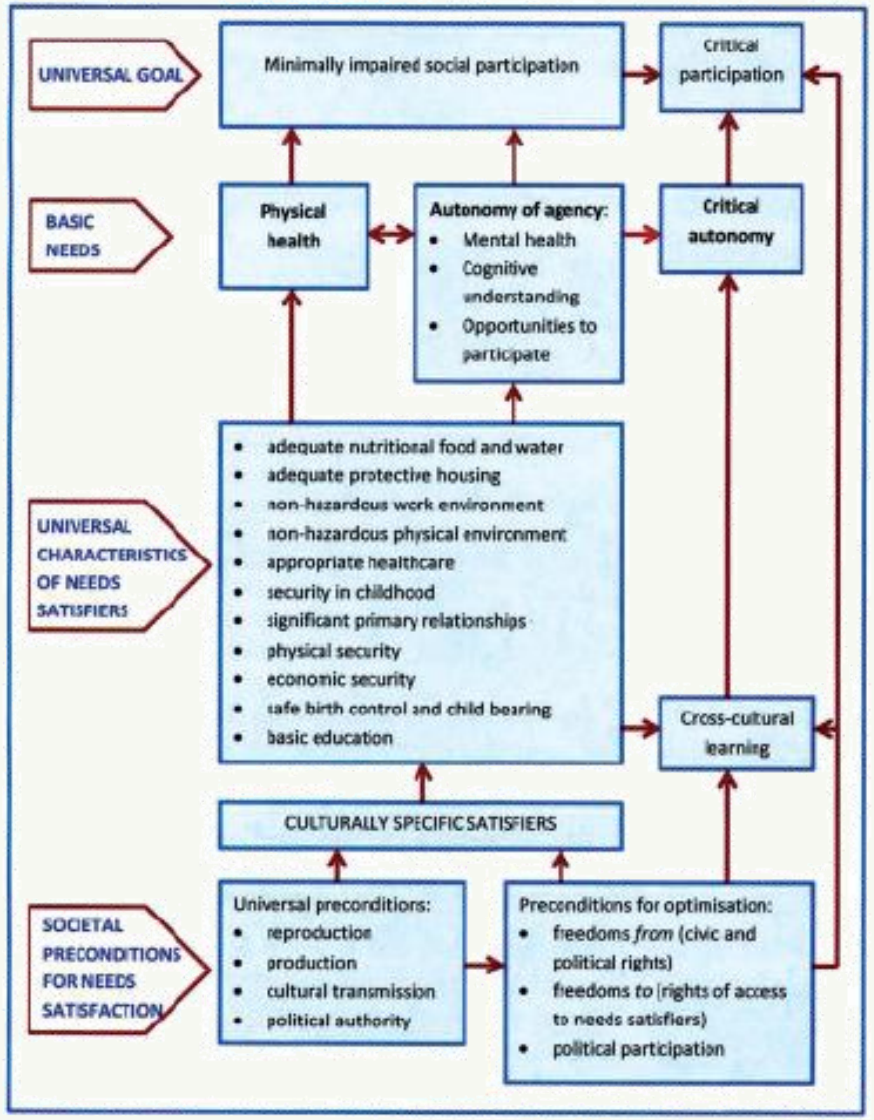
Well-being conceptualization





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Operationalization of well-being: UK

Mental health

Physical health

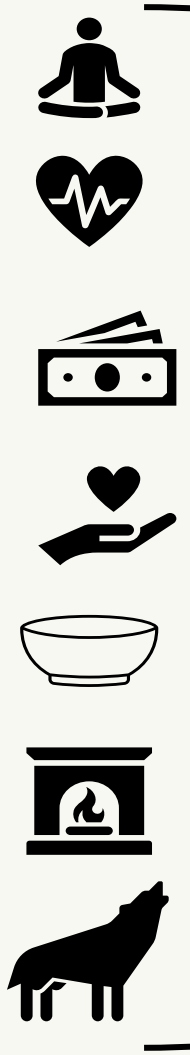
Financial situation

Subjective well-being index

Assessment of poverty

Having adequate heating

Loneliness



Well-being score (WBS): Min 0 Max 70 points

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Operationalization of well-being: UK

Mental and physical health 

Financial situation 

Subjective well-being index 

Assessment of poverty 

Having adequate heating 

Loneliness 

High Well-Being (HWB): above average WBS + having adequate heating + being above poverty line

Low Well-Being (LWB): below average WBS

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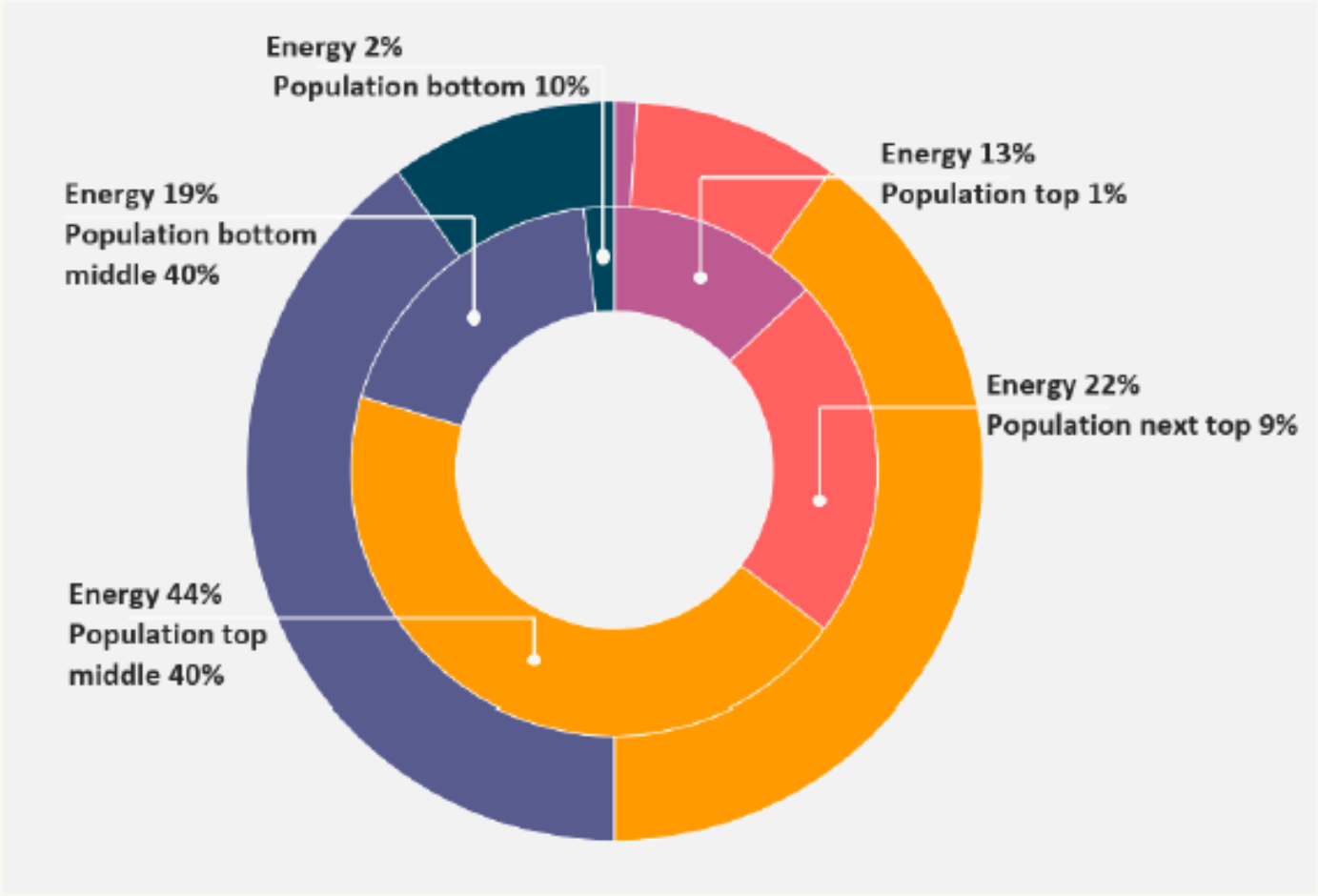
EF distribution



Distribution of Energy footprint in population (%). The shares of population calculated on the energy footprint basis.

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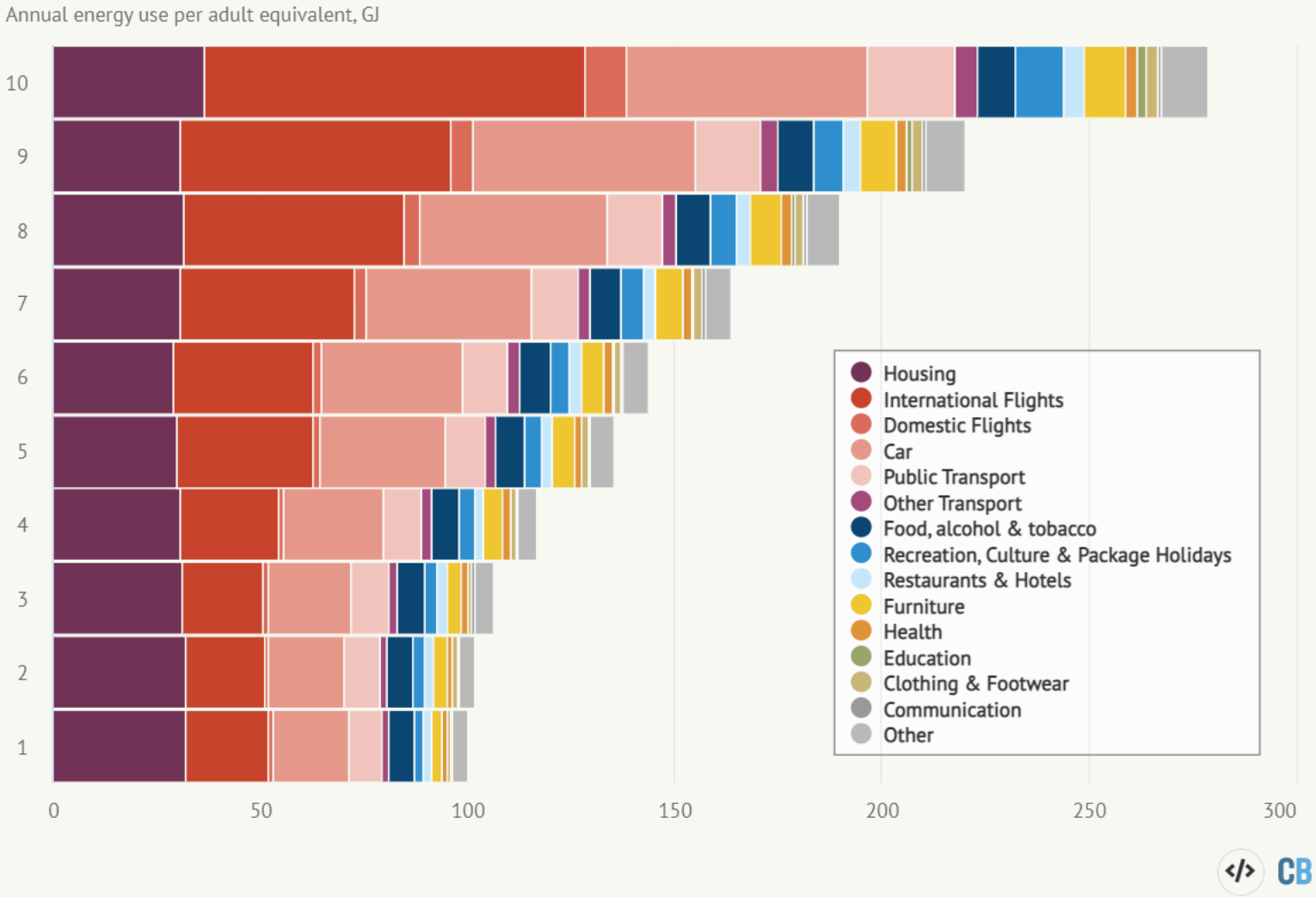
Annual energy use by income



Energy footprints of British households in 2019 by income grouping, where 1 is the lowest income 10% of the population and 10 is the highest income 10%. Footprints are measured in gigajoules (GJ) per "adult equivalent", which is based on dividing the energy use of a household by the number of people, accounting for the fact that children contribute less. Chart made by Tom Prater for Carbon Brief using Highcharts. Source: Baltruszewicz et al. (2022).

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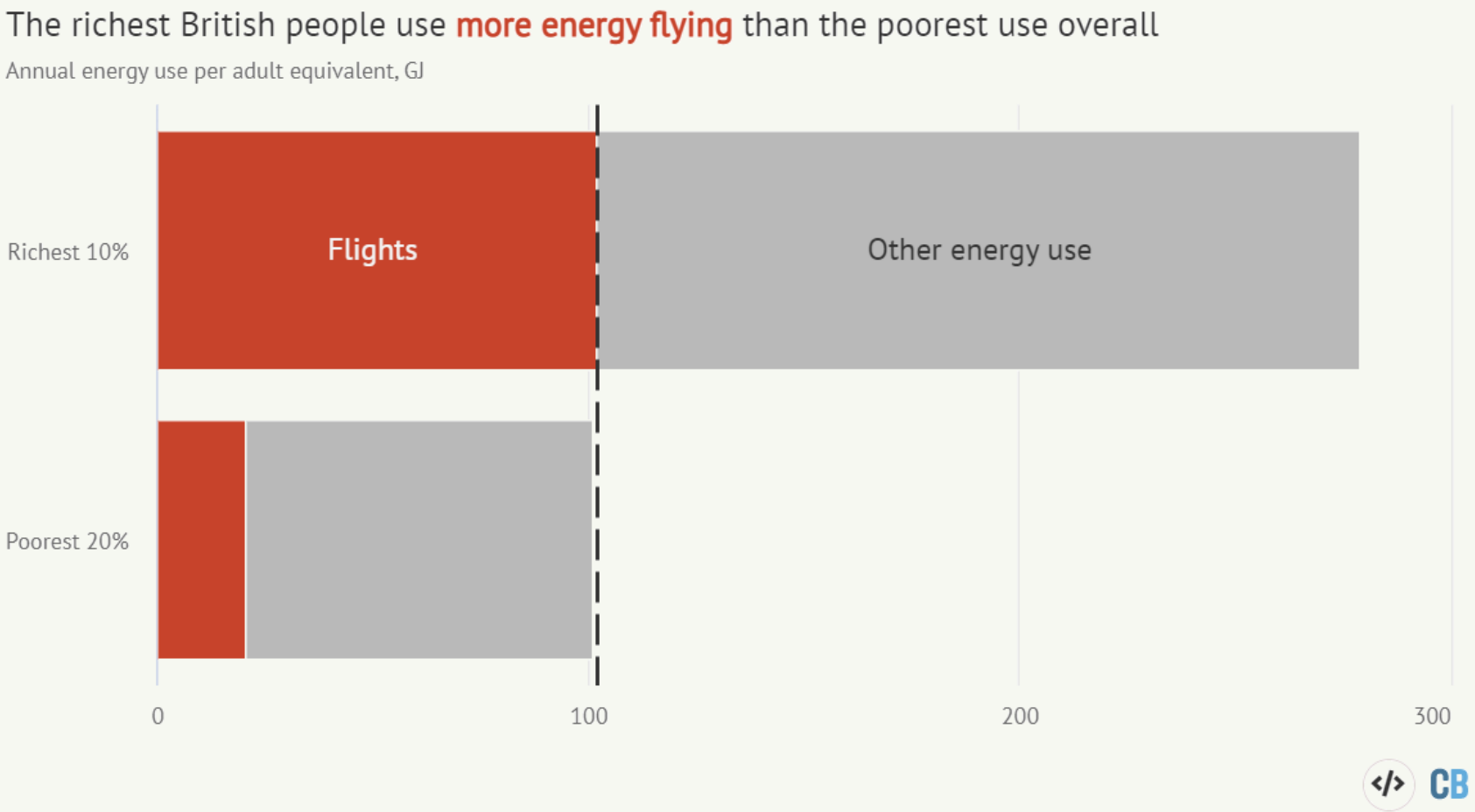
Richest people in UK ‘use more energy flying’ than poorest do overall



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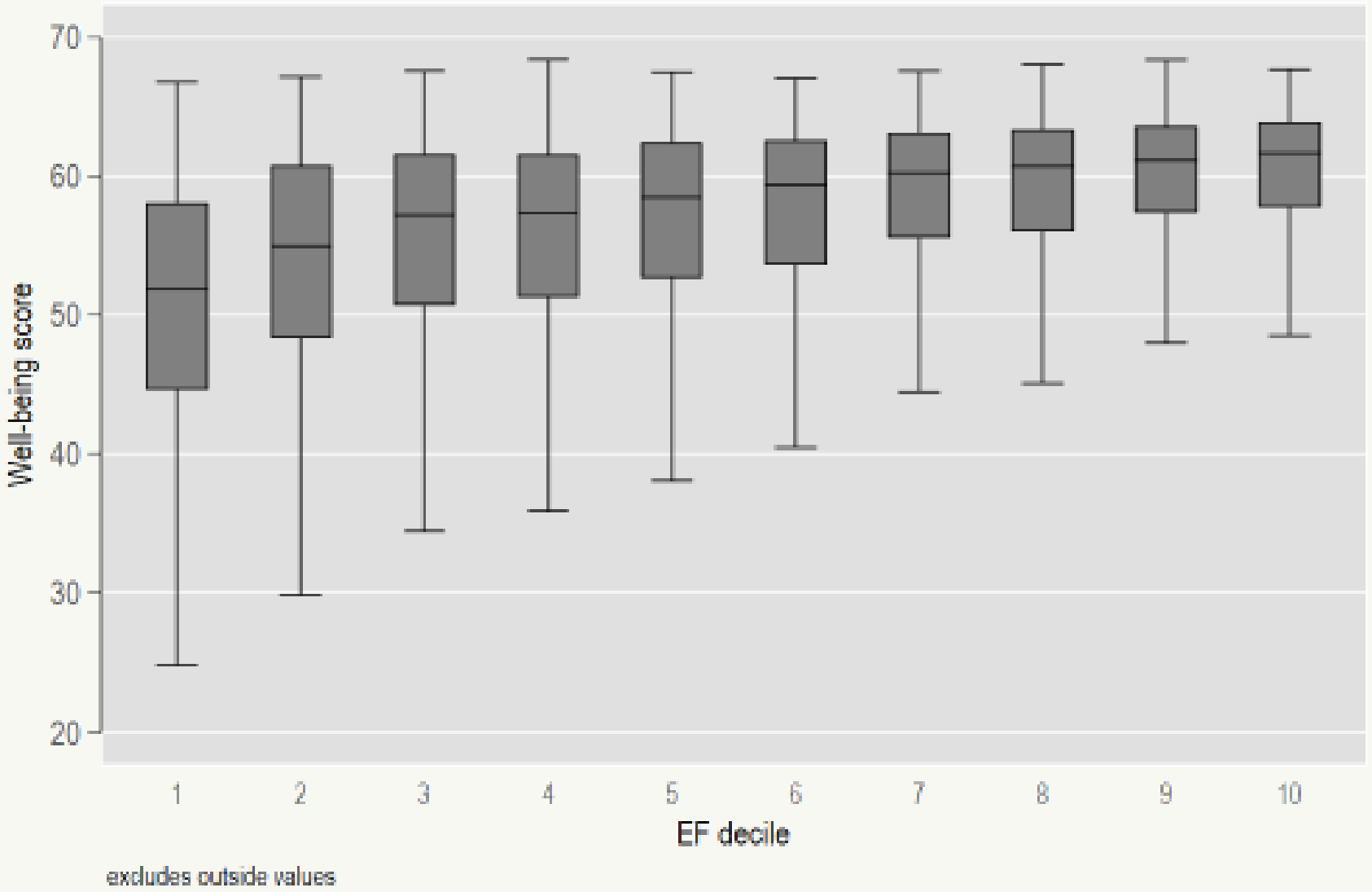
More is not necessarily better – saturation of WB with increases in EF



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EF levels and composition by high and low well-being

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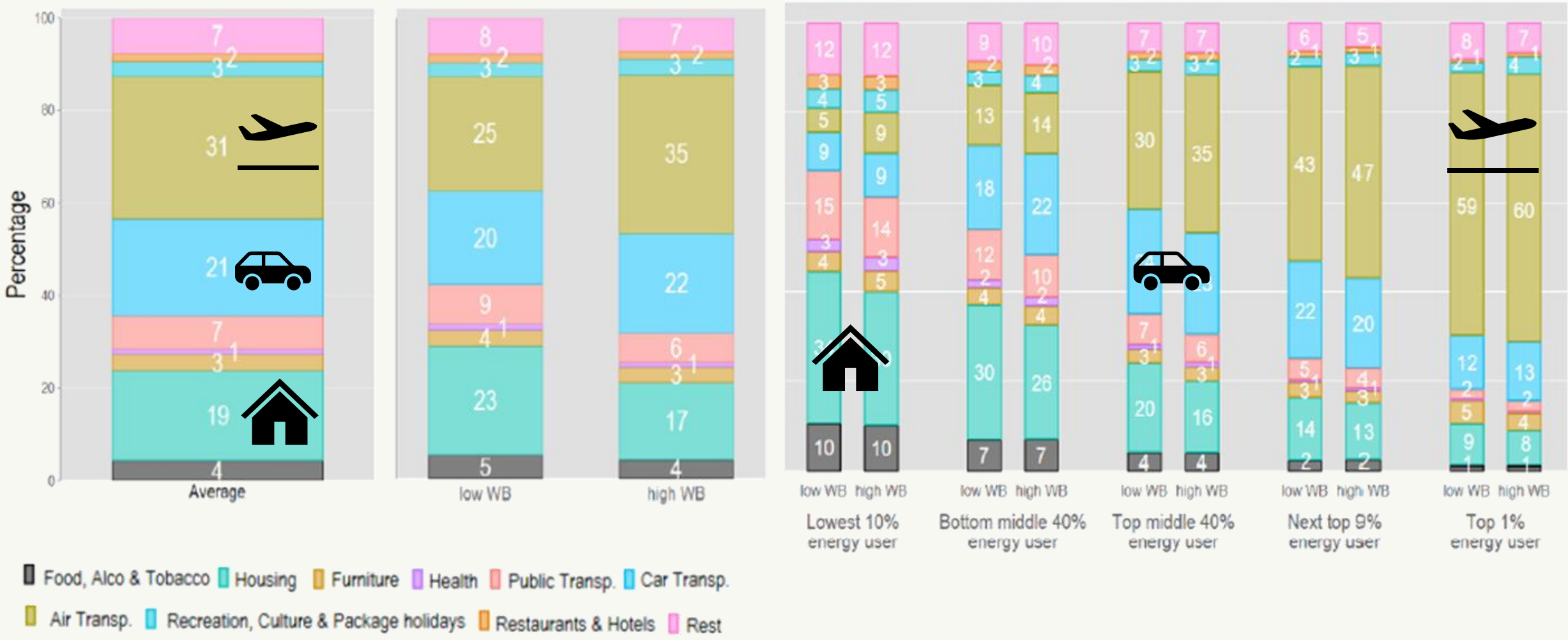
Energy use for fun or necessity?



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Well-being components vs Energy demand

Improvement in mental health and subjective well-being does not increase energy demand

Lower Housing EF is associated with better physical health and adequate heating

Increases in EF of car-transport has positive effects on WB components BUT increases in air travel are **not** associated with increases in mental health, subjective well-being or loneliness (and well-being score)

Energy increases are associated with higher income and material services

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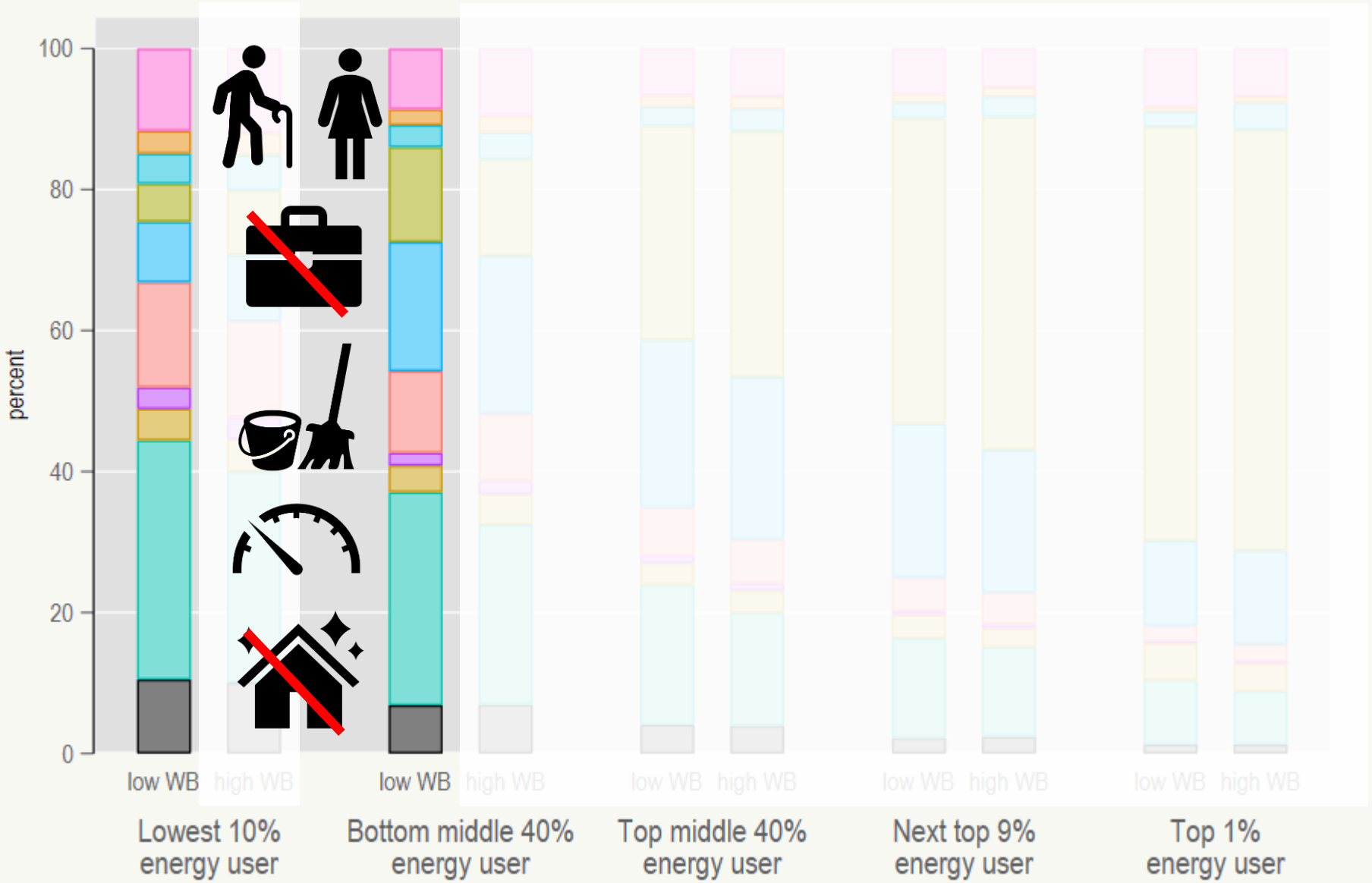
Importance of protective characteristics



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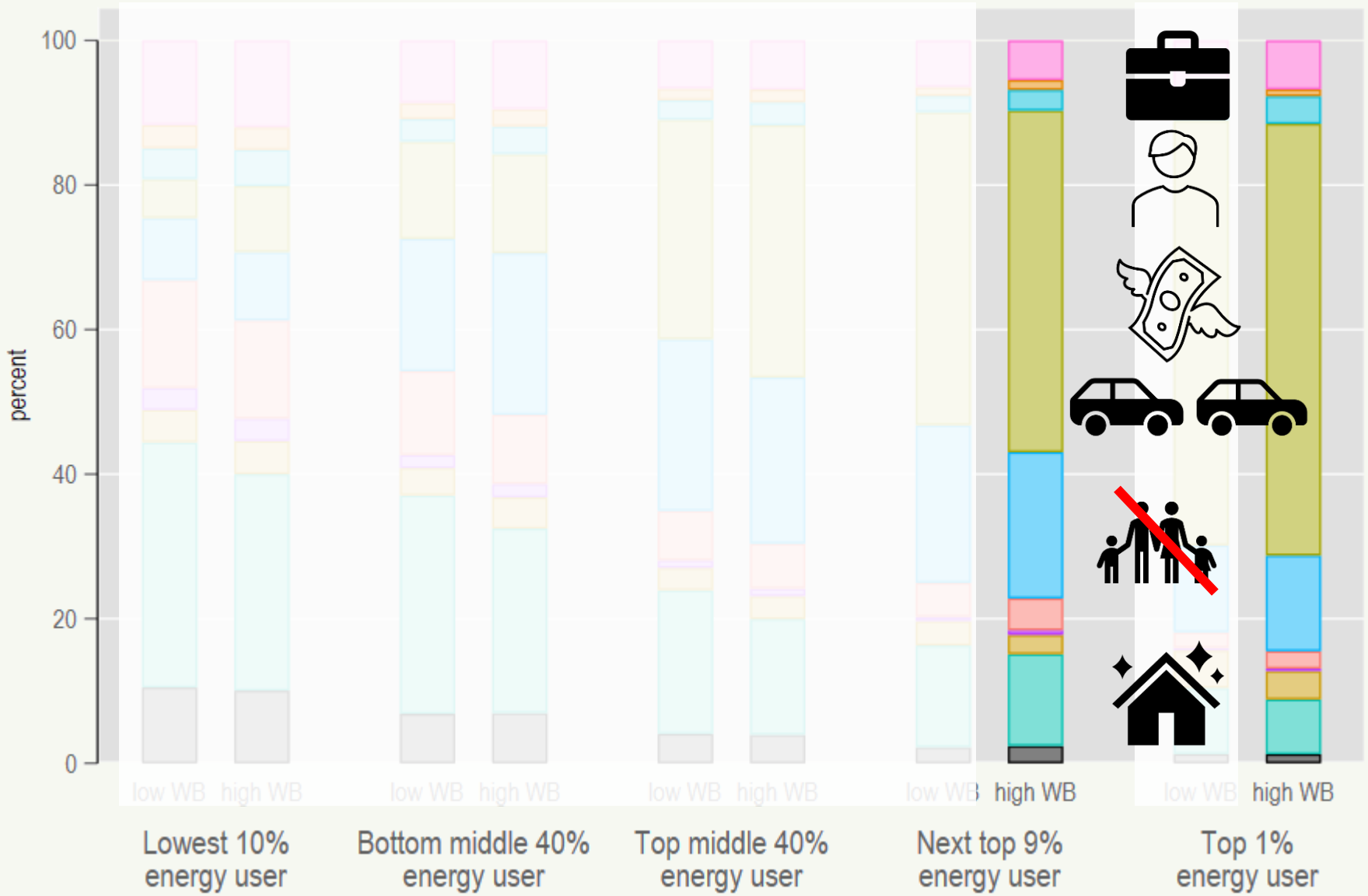
Characteristics of high emitters



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Key messages to take home

- **Poverty drives housing energy demand up**
- **Excessive lifestyles and energy use do not guarantee high well-being**
- **Current provisioning systems locks us into high and inefficient energy use (e.g. car dependency)**
- **Vulnerable and underrepresented groups should be prioritized in energy transition or energy redistribution policies**

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So what

- Small minority with HWB uses excess energy. Therefore, it is possible to reconcile maintenance of high WB and energy demand reduction.
- Among those with HWB private transportation EF is systematically higher
- The introduction of stringer taxation on high emitters and limiting access to damaging to environment and humans products (e.g. SUV) are necessary
- Equity principles such as sufficiency, understood as to everybody according to their needs (but not wants), might help bring about more equal outcomes for all.

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Thank you!

Questions?

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