

The Carbon Footprint of Swiss Households

How the consumption-based responsibility for global warming is distributed in Switzerland

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Background

- Oxfam America's report *Climate Equality*¹ compares annual consumption related emissions from different parts of the global population.
 - The bulk of responsibility for lies with the richest.
 - Lifting the poor out of extreme poverty can be compensated by meaningful emissions reductions by the rich.
- World Inequality Lab's *Climate Inequality Report 2023*²
 - reaches similar conclusions as Oxfam's report and
 - analyzes distribution of consumption related emissions within countries.
- Sotomo and Helion's report *Helion Energiewende-Index*³
 - compares different population groups in Switzerland,
 - differentiates rough categories of consumption, and
 - compares actual emissions with self-assessment and attitudes.

¹Ashfaq Khalfan et al. (2023). *Climate Equality: A planet for the 99%*. Tech. rep. Oxfam International. DOI: [10.21201/2023.000001](https://doi.org/10.21201/2023.000001).

²Lucas Chancel, Tancrede Voituriez and Philipp Bothe (2023). *Climate Inequality Report 2023*. World Inequality Lab Study 2023/1. URL: <https://wid.world/wp-content/uploads/2023/01/CBV2023-ClimateInequalityReport-3.pdf>.

³Simon Stükelberger, Gordon Bühler and Michael Hermann (Jan. 2024). *Helion Energiewende-Index*. Tech. rep. Sotomo. URL: https://sotomo.ch/site/wp-content/uploads/2024/01/Helion_Energiewendeindex_2024.pdf.

Questions

- What is the situation in Switzerland?
- What consumption categories drive differences in carbon footprints?
- How do different parts of the Swiss population compare in terms of carbon footprints?
- What conclusions can be drawn for policy making?

- Use survey data for determining which household consumes what.
- Employ life cycle analysis (LCA) for determining global warming potential (GWP) of different consumption categories.
- Group households into different parts of Swiss population
 - for comparing consumption based responsibility for global warming and
 - for analyzing who emits how much through which behaviour.

Haushaltsbudgeterhebung (HABE):⁴

- survey of 9955 households (3000+ per annual wave)
- income by sources
- expenditures by categories (in CHF, kg, litres)
- household composition, ownership of dwelling, etc.

LCA data from OASES project:⁵

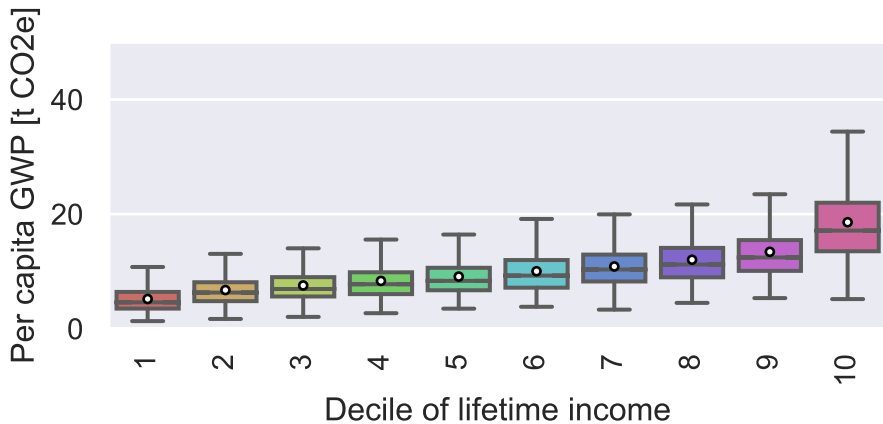
- based on several life cycle inventory databases
- methodology according to Froemelt, Dürrenmatt and Hellweg⁶
- harmonized to HABE's consumption categories and units
- gives global warming potential in kg CO₂-eq per unit consumed.

⁴Bundesamt für Statistik, Haushaltsbudgeterhebung (HABE) 2015–2017

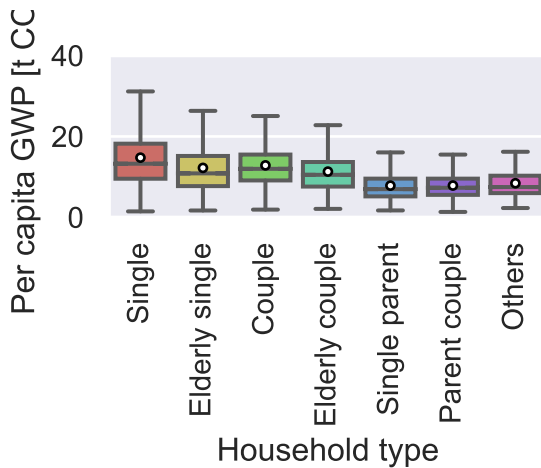
⁵Arthur Jakobs and Chris Mutel (Apr. 2023). *NFP73 Co-Creation Lab "Data Transparency for Sustainability"*. original-date: 2023-04-04T06:23:36Z. URL: <https://github.com/OASES-project/CCL-results> (visited on 12/01/2024).

⁶Andreas Froemelt, David J. Dürrenmatt and Stefanie Hellweg (Aug. 2018). "Using Data Mining To Assess Environmental Impacts of Household Consumption Behaviors". In: *Environmental Science & Technology* 52.15, pp. 8467–8478. DOI: 10.1021/acs.est.8b01452.

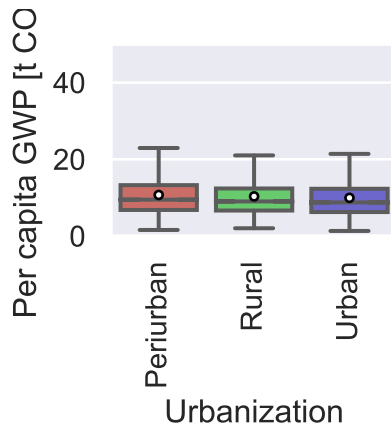
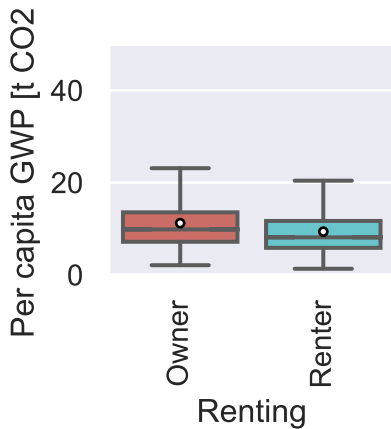
Findings: Overall per-capita GWPs



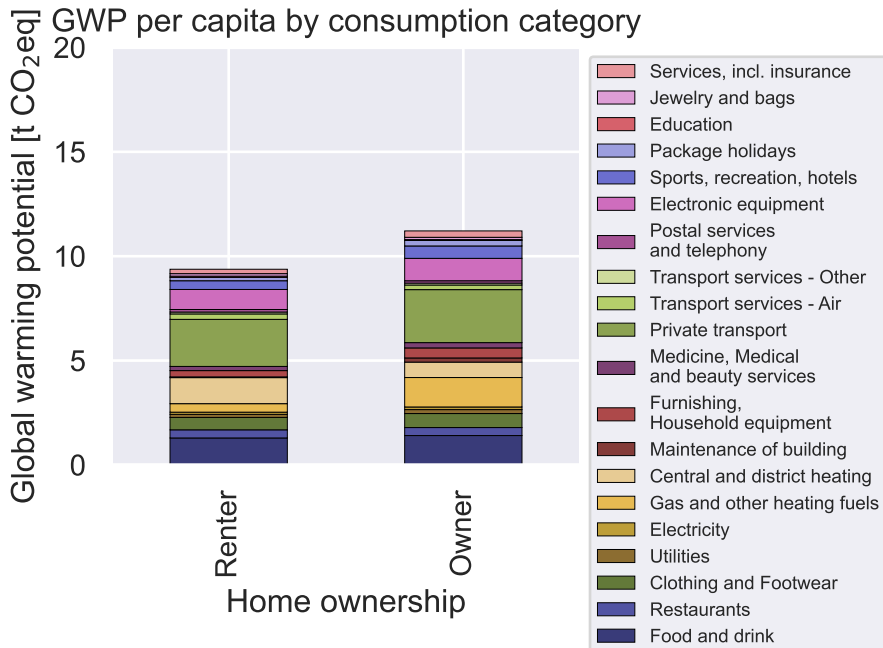
Findings: Overall per-capita GWPs



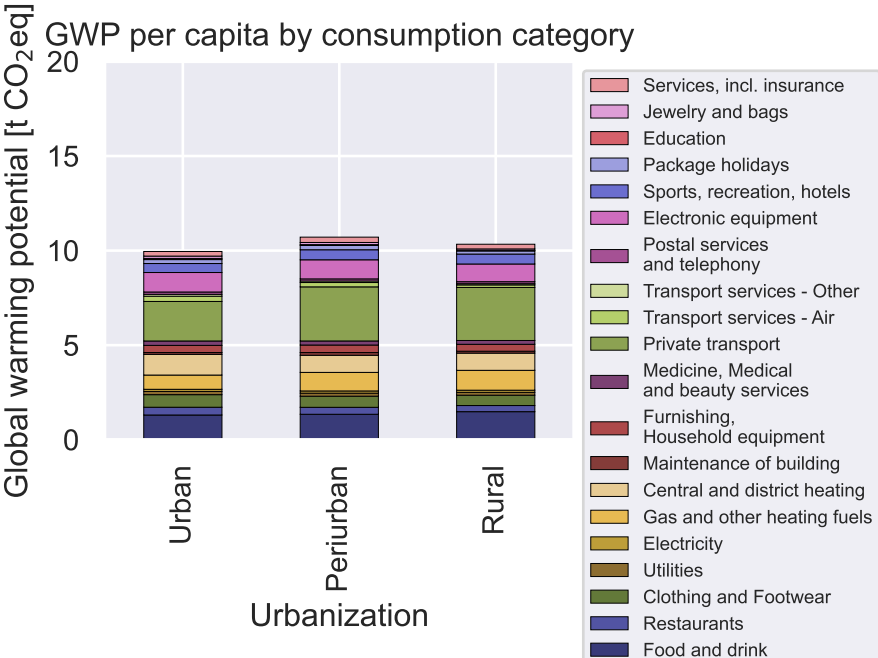
Findings: Overall per-capita GWPs



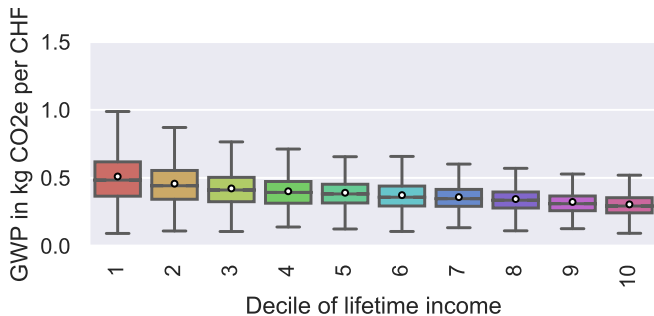
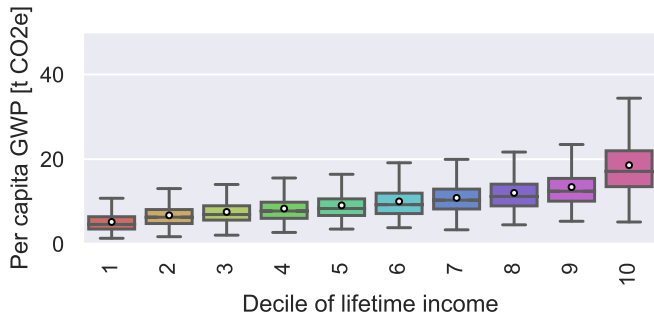
Findings: GWPs per consumption category



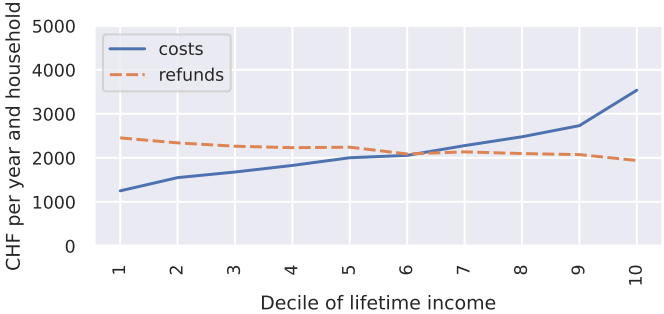
Findings: GWPs per consumption category



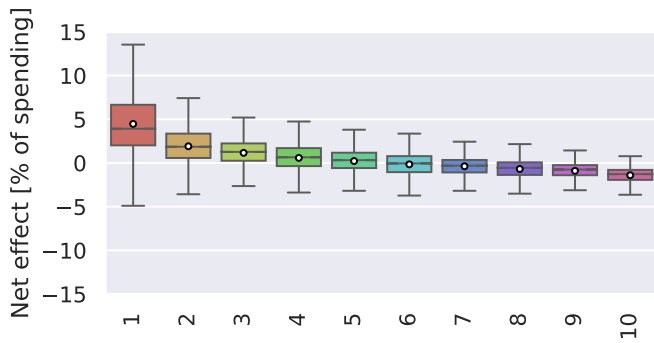
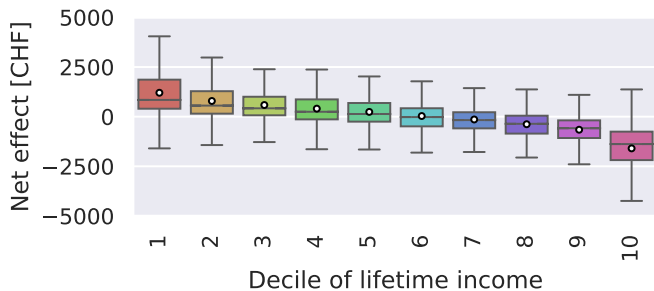
Policy implications



Policy implications (recycling revenue from carbon pricing)



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Policy implications

- Heterogeneity within population groups is considerable! In the low-income decile in particular, increasing costs of emissions/emissions abatement can cause hardship cases.
- Why not levy CO₂-Abgabe on motor fuels as well as on heating fuels? With current design:
 - Elderly people more impacted
 - Low-income households relatively more impacted
 - (Other) studies show: Rented dwellings have fewer heat-pumps installed than owned dwellings.
 - (But at least, renters emit less through heating than owners.)
- As climate policy expands in scope (more GHGs, more world regions), we can expect the following trends to continue:
 - Currently emission intensive activities become more expensive (emissions pricing / emissions abatement).
 - This cost is lower for high income households on a per-CHF-spent basis.
 - On an absolute basis, high-income households spend more on that cost.
 - Emissions pricing with revenue recycling can be expected to be progressive (i.e. better for low-income households on a per CHF spent basis).

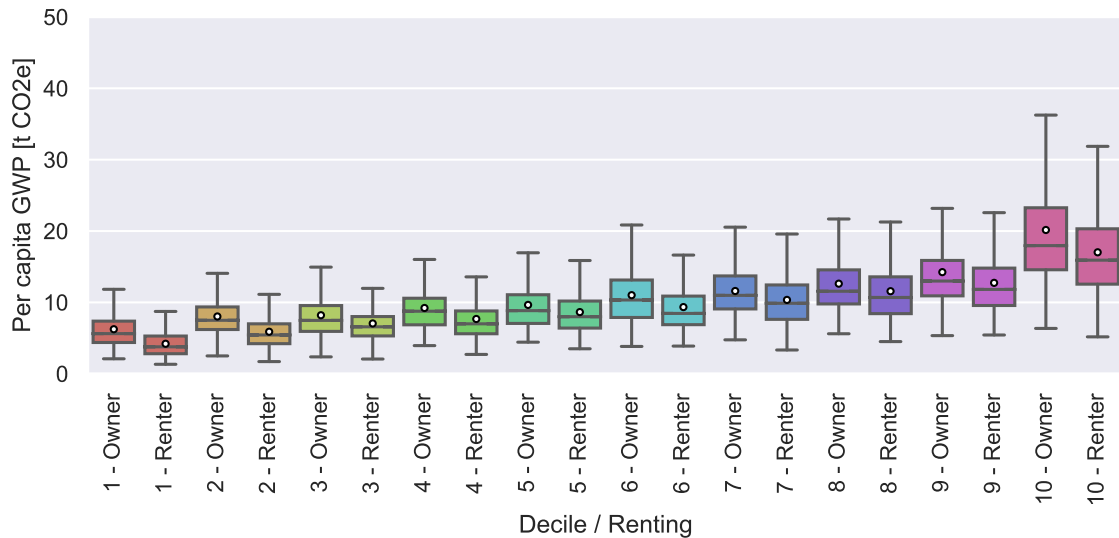
Thank you for your attention

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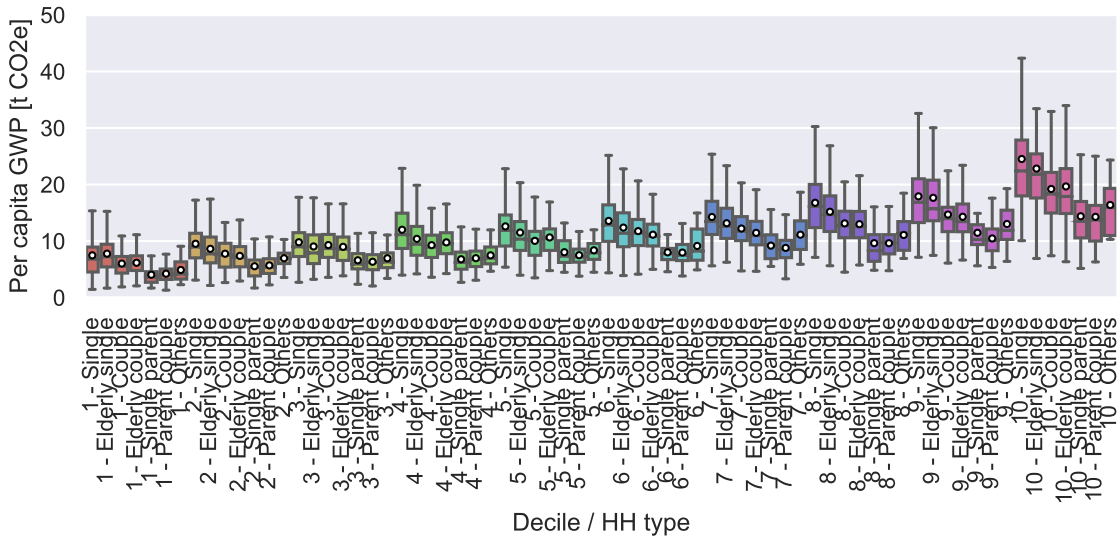
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Income v Ownership status



Income v Household composition



Income v Urbanization

