



Policy Brief 2:8

Excerpt from the Swedish report Konsumtionens gränser. (The Limits of Consumption)

Rebound or spillover? Net climate impacts of low-carbon lifestyles and the role of environmental self-identity

Switch to a more fuel-efficient car but end up driving more? Cycle to work all year only to fly on holiday? When people change their lifestyles, emissions can sometimes be offset elsewhere – either because lower costs free up money for other consumption (an economic rebound effect) or because people feel they have “earned” the right to indulge (behavioural compensation). Rebound effects are often assumed – explicitly or implicitly – in modelling and policy evaluations. But for demand-side mitigation, the opposite pattern is also plausible: people who change because they care may be less prone to “spend” the savings on higher-emission consumption. Lifestyle changes may even trigger positive spillover, where one climate-friendly choice leads to additional low-carbon choices in other areas. In three studies, we test these two explanations. We find limited evidence of systematic offsetting, and we see signs that environmental self-identity (ESI) helps predict whether households show rebound-like patterns or reinforced climate gains.



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Study 1: Car replacement and driving distance

We analyzed all Swedish car owners who replaced their car in a given year. The results showed a rebound effect of about 30 percent, meaning that 30 percent of the emission reduction given by increased fuel efficiency was offset by increased driving distance. By contrast, we found no increase in driving distance among those who switched to an “environmental car” (miljöbil), indicating no rebound effect. This implies that environmental motivation may curb rebound.



Across studies, low-carbon lifestyle behaviours are associated with substantial net emission reductions, with limited evidence of systematic offsetting elsewhere.

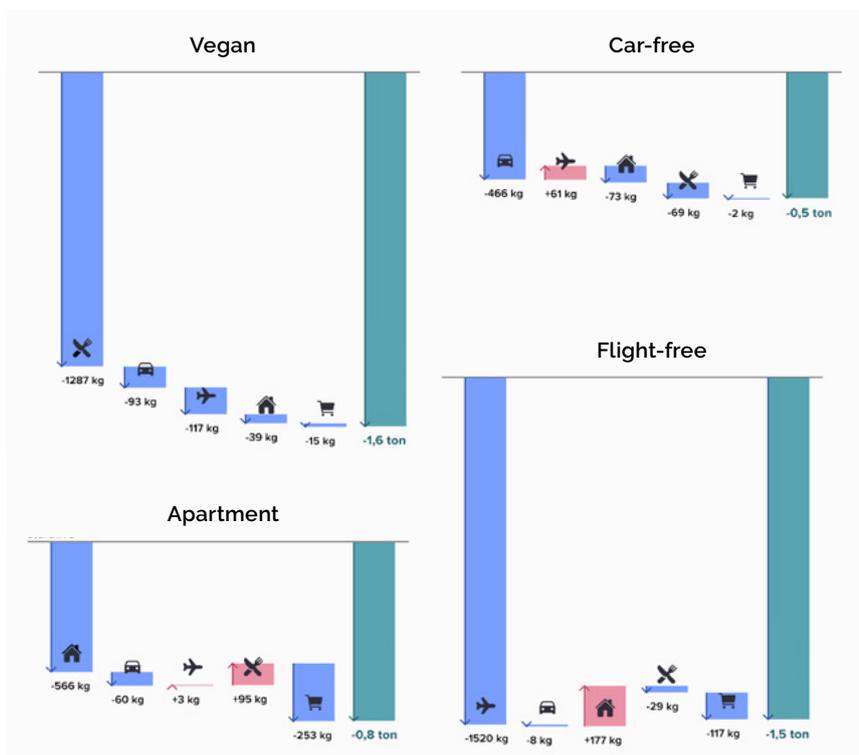
Study 2: Transaction data reveal total consumption patterns

In a second study of 700 users of a carbon footprint calculator, we estimated emissions for each purchase using bank transaction data. We examined four lifestyle choices: not owning a car, not flying, not living in a detached house, and having a vegan diet. Each choice was associated with large emission reductions—approximately 0.5 to 1.5 tonnes CO₂e per person per year. We found no evidence that participants increased consumption in other areas, even when financial savings from lifestyle choice were substantial. Because this sample consisted of environmentally engaged participants, an important question remained: does the pattern also hold in the wider population?

Study 3: Environmental self-identity helps explain who rebounds – and who doesn't

In a third (not yet published) study, we followed a random sample of 1300 single-adult households, combining transaction data with surveys. We studied three choices: not owning a car, not flying, and being vegetarian. All three choices delivered large net emission reductions – around 0.7 to 1.9 tonnes CO₂e per person per year. Consistent with the previous study, the total climate benefit was larger than the direct effect of each choice, which is consistent with positive spillover rather than rebound effects.

In this study, we also asked participants about their environmental self-identity – the extent to which they see themselves as environmentally friendly – and tested whether it relates to rebound or spillover effects. We found that people with a stronger environmental self-identity had lower total consumption emissions than others making the same lifestyle change, and were less likely to engage in offsetting behaviours (and vice versa).



Greenhouse gas emissions for four low-carbon lifestyles

Difference in consumption-based emissions (kg CO₂e per person per year) between the target group (e.g., people without a car) and the comparison group (e.g., people with a car), by emission category. Negative values indicate lower emissions than the comparison group. Left bar = behaviour-specific category (car, flying, housing, and food); right bar = total emissions. When the total reduction is larger than the direct reduction, this indicates a positive spillover effect (the opposite of a rebound effect). This pattern is observed in three of four cases (all except flying). Results are adjusted for background factors; small deviations are due to rounding. Interpretation (example: people without a car): transport -466 kg, flying +61 kg, housing -73 kg, food -69 kg, other -2 kg total = -500 kg CO₂e per person per year. Source: Andersson & Nässén (2023). Illustration: Felicia Kernehed.



Rebound isn't the default outcome.



Difference in Environmental self-identity may explain rebound vs spillover.

What do we learn across studies?

Taken together, the studies point to a consistent pattern: several major lifestyle choices—such as car ownership, flying, housing type, and diet—are associated with substantial net reductions in total consumption emissions. In the transaction-based studies, net effects often exceed the direct effect of the lifestyle choice, which is consistent with spillover rather than rebound.

At the same time, the results suggest meaningful heterogeneity. Not all households respond in the same way, and the correlational evidence indicates that environmental self-identity (ESI) can explain these differences. Participants with stronger ESI tend to have lower total emissions among those making the same lifestyle change, and show fewer signs of offsetting increases in other consumption categories. This points to ESI as a plausible factor for understanding when lifestyle change leads to rebound-like patterns versus reinforced climate gains.

Implications, limitations, and next steps

These findings inform how we think about societal transition processes and highlight the potential role of environmental motivation. In economic and energy modelling, rebound effects are often applied as standard parameters when translating behavioural change into emissions reductions. Our results suggest that such parameters can be too blunt for lifestyle change: in our settings, average rebound is limited, and the direction and magnitude of “secondary effects” appear to vary with household characteristics and motivations—factors that may differ across societies and over time. This points to the value of moving beyond simplified income- and substitution-effect assumptions and instead using empirically grounded variation across populations, behaviours, and contexts when estimating the impacts of lifestyle change.

Several limitations should be kept in mind. The first study provides strong quasi-experimental evidence using rich microdata, matching, and sample restrictions, but it cannot fully disentangle the effect of choosing an environmental car from unmeasured motivations correlated with that choice, and it does not capture indirect effects on total consumption emissions. The two later studies, by contrast, capture households' full carbon footprints and relate environmental self-identity (ESI) to rebound/spillover patterns, but the evidence is correlational and does not establish causality. Ongoing work examines the robustness of the ESI association and tests whether other contextual factors help predict when lifestyle changes are followed by rebound versus spillover.



Further reading – or ask questions using www.greenchat.se/eng

- Andersson, D., Linscott, R., and Nässén, J. (2019). [Estimating car use rebound effects from Swedish microdata. Energy Efficiency](#)
- Andersson, D., and Nässén, J. (2023). [Measuring the direct and indirect effects of low carbon lifestyles using financial transactions. Journal of Cleaner Production](#)
- Andersson, D., and Nässén, J. (2025). [Low carbon lifestyles deliver broad climate benefits, strengthened by environmental self identity. Research Square](#)

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For further information, see:
www.sustainableconsumption.se/en

Reference to this text

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