



# SCIENCE FOR ENVIRONMENT POLICY

## Circular consumption: paying attention to potential rebound effects



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**The circular economy (CE) aims to reduce the use of virgin materials by reusing materials as much as possible.** This study examines which types of European households adopt circular consumption habits, how this is reflected in their material footprint and how rebound effects (when environmental actions result in financial savings or require consumer investments) may affect the overall impact.

Planetary material consumption has increased over recent decades, giving rise to growing concern over unsustainable resource use. The CE model has gained popularity, replacing the linear model of production, use and disposal (or 'take-make-dispose'). CE concepts of increasing the time that material remains in use and moving away from activities of high material consumption, can be applied to household consumers as well as businesses. Consumers may choose to adopt circular habits, such as switching to renewable energy, recycling and using repair and maintenance services. The rebound effects of circular consumption (such as a consumer spending money saved from energy-efficiency improvements — either by switching to a greener energy supplier or by turning up their heating), however, can either enhance or detract from the final environmental impact.

This study combines an examination of European households' circular-consumption habits with a material footprint analysis across 24 countries. To assess which types of households adopt circular consumption habits, data from the [Eurostat Household Budget Survey \(HBS\) 2010](#) was analysed, including the influence of socioeconomic background, age, gender, degree of urbanisation and education. To examine the material footprints of 189 800 households, the researchers linked the [Exiobase 2015](#) global input output model for materials to the HBS. This clarified whether specific household factors impact on circular-consumption habits and the effect on material footprint.



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## Circular consumption: paying attention to potential rebound effects (continued)

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1. The researchers found that in the Czech Republic, the decreasing material footprint of transportation was offset by the increasing material footprint of domestic gas and electricity; whereas in Spain, Finland and France, only part of the resource savings from using public transport were offset by higher use of services and increased holiday travel.

The researchers suggest there are three main limitations within the study — that the indicators were chosen using a subjective process — therefore other researchers may have used a different set of indicators; the environmental indicator of material footprint is limited by the fact that it sums up all materials, regardless of place of origin or type of material; and the material footprint of construction of buildings and infrastructure is largely excluded due to data limitations.

To investigate the link between socioeconomic variables and consumption behaviour, the researchers selected circular- and linear-consumption indicators from CE literature. Secondly, they focused on how life stage affects consumption habits; and included education, age, gender and the degrees of urbanisation within their analysis. Finally, they considered the connection between specific circular-consumption habits and material footprints — the purchase of repair and hiring services, public transport and a vegetarian diet (excluding meat) — and examined the potential rebound effect of adopting circular-economy habits.

The researchers did not find a clear leader of circular consumption amongst household type, but rather that different types (young, old, families etc.) adopt a variety of circular habits in how they consume products and services. The analysis also showed that although consumption choices may likely have a major impact on environmental footprints, their effect is often limited in practice, as most consumers have little knowledge or understanding of rebound effects. Consequently, they may have large footprints, despite practising environmental habits in some areas of their lives — and, therefore, particular attention should be paid to potential rebound effects. Using repair and hiring services, for example, does not actually appear to decrease material footprint — this may be because of a rebound related to monetary savings from using this type of service; while an increased use of public transport often reduces material footprints, although the related rebounds can be marked<sup>1</sup>.

The study suggests that it is important to be aware of potential rebound effects from circular consumption — and, therefore, there is a need to monitor and address these effects. The researchers posit the need for stronger policy incentives for circular consumption to maximise and deliver on its environmental benefits, such as shifting taxation from renewable resources and labour to non-renewable resources, and phasing out of fossil fuels. In addition, non-monetary policies, such as green product labels and nudging, can support eco-efficiency and eco-design, guiding consumer choices towards products and services with low material intensity. However, these incentives are insufficient alone and are part of a comprehensive transition addressing the entire life cycle of products, including sustainable consumption, since circular economy aims at economic growth and increasing household budgets.