



Delft University of Technology

Beyond efficiency

Rebound effects and the socio-material complexities of circular consumption

Greene, Mary; Kloppenburg, Sanneke; Van Dam, Sonja; Ruzzenenti, Franco

DOI

[10.1332/27528499Y2025D000000053](https://doi.org/10.1332/27528499Y2025D000000053)

Publication date

2025

Document Version

Final published version

Published in

Consumption and Society

Citation (APA)

Greene, M., Kloppenburg, S., Van Dam, S., & Ruzzenenti, F. (2025). Beyond efficiency: Rebound effects and the socio-material complexities of circular consumption. *Consumption and Society*, 4(2), 325-337. <https://doi.org/10.1332/27528499Y2025D000000053>

Important note

To cite this publication, please use the final published version (if applicable).
Please check the document version above.

Copyright

Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

Takedown policy

Please contact us and provide details if you believe this document breaches copyrights.
We will remove access to the work immediately and investigate your claim.



*Special Issue: Everyday Circularities: Rethinking Consumption
in Circular Transformation*

COMMENTARY

Beyond efficiency: rebound effects and the socio-material complexities of circular consumption

Mary Greene, mary.greene@wur.nl

Sanneke Kloppenburg, sanneke.kloppenburg@wur.nl

Wageningen University, The Netherlands

Sonja Van Dan, S.S.vanDam@tudelft.nl

TU Delft, The Netherlands

Franco Ruzzenenti, f.ruzzenenti@rug.nl

University of Groningen, The Netherlands

Rebound effects remain an overlooked but critical challenge in circular economy transitions. While existing research predominantly frames rebound effects as economic, behavioural or technological phenomena, these perspectives fail to fully account for the social and material dynamics through which rebounds emerge. This commentary argues that social practice theories offer a more systemic approach to understanding rebound effects by shifting focus from individual decision-making and efficiency gains to the interconnections between everyday practices, temporal and spatial reordering, and systems of provision. We outline four key conceptual resources from social practice theories – recrafting practices, practice interconnections, temporal and spatial reordering, and systems of provision – that help explain how rebound effects unfold within circular consumption. We also discuss the methodological challenges of integrating social and material assessments of rebounds. Moving forward, we call for interdisciplinary and practice-based research to deepen empirical investigations into how circular consumption practices evolve and how their unintended consequences can be anticipated and mitigated. By embedding practice-theoretical insights into rebound research, future research and policies can contribute to more effective and systemic approaches to circular transformation.

This Commentary is part of a Special Issue titled, *Everyday Circularities: Rethinking Consumption in the Circular Transformations*, edited by Kersty Hobson and Mary Greene.

Keywords consumption • circular economy • rebound effects • social practice theory
• interdisciplinary research

To cite this article: Greene, M., Kloppenburg, S., Van Dan, S. and Ruzzenenti, F. (2025) Beyond efficiency: rebound effects and the socio-material complexities of circular consumption, *Consumption and Society*, 4(2): 325–337, DOI: 10.1332/27528499Y2025D000000053

Introduction: Why rebounds matter in the circular economy

Discussions on the circular economy (CE) focus largely on closing material loops, increasing efficiency and reducing waste. However, as efforts to scale up circular practices intensify, rebound effects remain a critical challenge. Such rebound effects occur when sustainability gains are partially or fully offset by unintended increases in resource use elsewhere (Berkhout et al, 2000; Reimers et al, 2021). While often framed as a technological (Ruzzenenti and Basosi, 2008) or economic problem (Khazzoom, 1989), rebound is better understood as arising from the way people live, consume and interact with socio-material infrastructures in everyday life (Greene et al, 2024).

This commentary builds on and advances recent innovations in practice-based perspectives on rebound effects. While still an emerging field, this approach reframes rebound as a social and systemic phenomenon, rather than simply a behavioural or economic response to efficiency gains (for example, Galvin and Gubernat, 2016; Sonnberger and Gross, 2018; Suski et al, 2021; 2024; Greene et al, 2024). Moving beyond a focus on price incentives or individual decision making, practice-based research highlights the role of networked practices, socio-material infrastructures and cultural norms in shaping rebound effects. However, despite these insights, practice-theoretical approaches to rebound remain underexplored in research and policy (Greene et al, 2024). Given the urgency of circular transitions, there is a pressing need to expand this work in impact-focused research programmes.

This commentary aims at contributing to this evolving conversation by considering how social practice theories can be more fully integrated into rebound research, particularly interdisciplinary studies of circular consumption. Rather than treating rebound as an isolated behavioural response, a practice approach examines how shifts in everyday practice constellations and systems of provision shape consumption dynamics. What is at stake is not just a better understanding of rebound, but a fundamental shift in how circular transformations are framed, to foreground sufficiency over efficiency, society over economy, and the messy realities of everyday life.

The discussion proceeds as follows. First, we critically examine dominant approaches to rebound effects and outline their limitations in capturing the systemic nature of consumption. We then introduce social practice theory as an alternative framework, illustrating how shifts in practice performances and constellations lead to unintended increases in resource use. Finally, we reflect on the implications of this approach for research design and discuss how this has been approached in ShaRepair Practices, a newly launched interdisciplinary and transdisciplinary research programme in the Netherlands that explores rebound effects in sharing and repair practices. We call on researchers, policy makers and practitioners to take the socio-material dynamics of rebound seriously and to further explore the potential of social practices to complement and advance current approaches.

Rebound effects in the circular transformations: limits of existing approaches

Rebound effects describe how sustainability gains are partially or fully offset by increases in consumption elsewhere. While well documented in energy studies (Ruzzenenti et al, 2019), rebound effects remain underexplored in research on the

CE, where efforts to promote repair, reuse and sharing may inadvertently drive new forms of material consumption. Understanding these dynamics is crucial to ensure that CE strategies do not simply shift resource use elsewhere in socio-material systems (Greene et al, 2024).

The rebound literature is dominated by technological, economic and behavioural perspectives (Reimers et al, 2021). Neoclassical economic models frame rebound effects as a market response, assuming that efficiency gains lead to further consumption or production (Druckman et al, 2011; Andrew et al, 2024). While these models provide quantifiable estimates of rebound, they prioritise rational decision-making and price elasticity as the primary drivers, overlooking the socio-material and infrastructural conditions that shape demand (Galvin and Gubernat, 2016; Wallenborn, 2018).

A more nuanced method of measuring rebound is life cycle assessment (LCA), which estimates resource flows and net sustainability impacts (Font Vivanco and van der Voet, 2014). However, the product-centric approach of LCA assumes static consumption patterns and does not account for how efficiency gains reshape everyday practices (Sonnberger and Gross, 2018; Suski et al, 2021). For example, a repaired smartphone may reduce e-waste, but if it is reused as a secondary device rather than replacing a new purchase, total energy use may increase. Existing LCA methodologies struggle to account for such systemic interdependencies and often produce overly simplistic and optimistic sustainability estimates (Suski et al, 2021; 2024).

Some models incorporate time-use rebound, recognising that efficiency gains can free up time for other resource-intensive activities (Jalas, 2009; Mizobuchi and Yamagami, 2022). However, they still treat time as an individual resource rather than one shaped by social norms, infrastructures and interwoven practices (see Shove et al, 2009). For example, faster transport and energy-efficient appliances may reduce commuting or domestic labour time, but this saved time is often diverted to other material-intensive activities rather than reducing overall consumption (Reimer et al, 2021). Thus, despite their importance, economic models struggle to explain non-monetary and system-wide rebound effects.

In response to these limitations, researchers have explored social psychological mechanisms behind rebound effects, in particular behavioural spillover theory (Thøgersen, 1999; Nash et al, 2017). This approach examines how a pro-environmental behaviour influences subsequent actions, sometimes reinforcing sustainable choices (positive spillover), but often triggering compensatory consumption (negative spillover) (Truelove et al, 2014). A key mechanism is moral licensing, where individuals who engage in a sustainable action feel justified in behaving less sustainably elsewhere. For example, consumers who purchase environmentally friendly products may perceive themselves as having 'done their bit', leading to an increase in overall consumption (Klöckner et al, 2013; Geng et al, 2016; Truelove et al, 2016). Similarly, goal satiation suggests that once individuals have performed a green action, they may feel that they have 'done enough', reducing further commitment (Truelove et al, 2014). Another factor is single-action bias, where individuals take a visible green action, such as purchasing an electric vehicle, but neglect broader lifestyle changes that would contribute to more substantial reductions in resource use (Gneezy et al, 2014).

While these studies provide valuable insights into the cognitive drivers of rebound, they remain highly individualistic, framing rebound effects as psychological processes rather than a systemic phenomenon embedded in infrastructures, policies and social expectations. As Nash et al (2017) argue, moving beyond economic and psychological

perspectives requires a shift in attention to the broader systems of provision and interconnected routines that shape consumption. It is to these that we now turn.

Potential of a social practice theory approach to rebounds

Existing research on rebounds has largely overlooked how rebounds arise through shifting relationships between social and material systems. Practice theories offer a promising alternative by shifting the focus from individual behaviour to the structuring of everyday routines, socio-material infrastructures and systems of provision. This perspective moves beyond structure–agency dualisms, instead framing social life as constituted by routinised ways of doing that integrate social, material and institutional arrangements (Reckwitz, 2002; Shove et al, 2012).

Although practice theories have gained traction in sustainable consumption research, their application to rebound effects remains limited, with only a small but growing body of work exploring their potential. By shifting the unit of analysis from individuals to practices, social practice theories reconceptualise rebound as an emergent property of interconnected and evolving practices, rather than a simple causal response to efficiency gains (Sonnberger and Gross, 2018; Andrew et al, 2024; Greene et al, 2024). Building on this work, we explore how rebound effects emerge through systemic, relational dynamics rather than isolated decisions. We focus on four key conceptual resources (see also Andrews et al, 2024) that social practice theories provide for the study of rebounds:

1. Recrafting practices: How changes in practice elements (materials, competences, meanings) shape rebound pathways.
2. Practice interconnections: How rebounds arise from relational and co-dependent nature of practices.
3. Temporal and spatial reordering: How efficiency shifts reshape the rhythms and spatial arrangements of consumption.
4. Practices and systems of provision: How infrastructural, economic and policy systems structure rebounds over time.

The following sections explore these themes, illustrating how social practice theory offers a systemic understanding of rebound effects in circular consumption.

Recrafting practices

A key strength of social practice theory in understanding rebound effects is its focus on how elements of practices – materials, competence and meanings (Shove et al, 2012) – are continually reconfigured. Such theories highlight how sustainability interventions can target these elements to *recreate* practices to reduce their resource intensity (Spurling and McMeekin, 2014). For example, recrafting can involve substituting less resource-intensive materials (for example, replacing disposable plastics with reusable alternatives), enhancing competences to encourage circular ways of doing (for example, promoting repair skills over replacement), or shifting meanings to normalise shared over individual ownership of goods. However, while recrafting can facilitate circular interventions, changes to practice elements can also inadvertently increase material demand (Sonnberger and Gross, 2018; Andrew et al, 2024; Suski et al, 2024).

Andrew et al (2024), for example, conceptualise rebound effects as ‘the dynamic reconfiguration of everyday practices and practice constellations triggered by a sustainability-oriented intervention, leading to changes in the performance of practice(s) that result in an increase in material intensity’. Accordingly, rebound is not simply about efficiency savings being redirected elsewhere, but about how changes in practice elements create new patterns of resource use. For example, some energy-efficient household appliances not only reduce energy consumption per use, but may also increase the frequency and intensity of use, leading to higher overall demand (Sorrell et al, 2009).

The material element of practices plays a central role in shaping rebound pathways. As Shove and Trentmann (2019) argue, infrastructure and objects actively shape how practices evolve. Research on household food storage illustrates this well: the introduction of larger, more energy-efficient freezers may be aimed at reducing household energy use, but it also allows people to store more food, which can change shopping habits and increase overall consumption (Hand and Shove, 2007; Middha et al, 2025). Similarly, while digital repair and resale platforms encourage reuse, they also facilitate higher product circulation, sometimes reinforcing rather than curbing material-intensive consumption patterns (Makov and Vivanco, 2018; Suski et al, 2021). These examples illustrate that when the material element of a practice changes, its performance and frequency can also change, reinforcing rebound effects as a systemic rather than a behavioural outcome (Wallenborn, 2018).

Similarly, when practices are recrafted, the relationships between elements of the practice also change. When efficiency improvements reduce the time, cost or effort required for a particular practice, the ‘saved’ resources do not simply disappear – they are redistributed elsewhere. For example, the shift to electric vehicles does not simply displace fossil-fuelled driving, but also reconfigures mobility expectations, driving habits and infrastructure use, often leading to greater overall energy demand (Galvin, 2016). Similarly, improvements in the efficiency of household appliances such as showers, washing machines and dishwashers have not reduced overall energy or water consumption, but have led to increased use and the normalisation of higher standards of cleanliness (Shove, 2003; Hand et al, 2005).

Practice interconnections

Rebound effects do not emerge in isolation in individual practices, but through their interconnections, sequences and interdependencies in everyday life. From a practice theoretical perspective, consumption unfolds through bundles of practices (Schatzki, 2002; Warde, 2005; Shove et al, 2012), meaning that efficiency interventions in one domain often ripple through others in unpredictable ways (Strengers and Maller, 2014). Rather than simply shifting demand elsewhere, rebound effects can reconfigure entire practice constellations, reinforcing material-intensive consumption (Wallenborn, 2015; 2018; Sonnberger and Gross, 2018).

The interplay between mobility and food consumption practices illustrates this. The widespread adoption of private cars, combined with road infrastructure developments, has expanded retail catchment areas, making supermarket and large retail centres more accessible. As a result, shopping patterns have shifted from frequent, small-scale trips to local stores towards less frequent but larger supermarket visits, often requiring longer travel distances and greater energy use (Greene, 2017; Greene and

Rau, 2018). While transport efficiency gains, such as fuel efficient vehicles, have reduced per-kilometre energy consumption, they have also enabled and reinforced these more dispersed shopping routines, ultimately increasing overall transport energy demand (Sonnberger and Gross, 2018). A similar dynamic can be seen in digital second-hand and resale platforms: while these extend the life of products, they also facilitate greater market engagement, which may sustain material exchange rather than reduce it (Turunen and Gossen, 2024).

Wallenborn (2015; 2018) identifies two ways in which efficiency interventions shape rebound effects: integration and dispersion. Integration links previously separate practices, expanding consumption. For example, fuel-efficient vehicles have broadened mobility patterns, linking new activities into mobility trips and increasing overall travel demand (Greening et al, 2000, Mattioli et al, 2016). In contrast, dispersion fragments and reorganises practices, creating new patterns of consumption. The shift from coal stoves to central heating illustrates this: heating, once confined to shared living spaces, became an independent practice across multiple rooms, significantly increasing household energy consumption over time (Wallenborn, 2015; Greene, 2018). Similarly, while energy-efficient heating systems reduce household energy bills, the financial savings are often reinvested in additional energy-intensive practices, such as heating previously unheated spaces or purchasing additional appliances (Wallenborn, 2015; Sonnberger and Gross, 2018).

Thus, rather than simply reducing consumption, efficiency interventions reconfigure practice interconnections that may intensify material demand in unexpected ways. Addressing rebound effects requires looking beyond individual behaviours to examine how these shifts reshape consumption patterns over time.

Temporal and spatial reordering of practice constellations

Everyday life unfolds within specific temporal rhythms and spatial arrangements that shape consumption (Shove et al, 2009; Southerton, 2013). Changes in infrastructure, technology and provisioning systems alter these patterns. From a social practice theory perspective, efficiency interventions reconfigure whether, when, where and how increased consumption occurs.

Everyday life is increasingly time-compressed, with new technologies enabling more activities in shorter periods of time (Schor, 1992; 2005; Rosa, 2013; Southerton, 2013). Rather than saving time, this acceleration may intensify material-intensive practices (Sonnberger and Gross, 2018). Shove (2003) describes this as a 'ratcheting up' effect, where efficiency gains create new consumption opportunities that gradually become established as social norms. For example, faster modes of transport, such as electric vehicles and high-speed trains, have not reduced overall travel time, but have instead expanded the range and frequency of mobility (Spielmann et al, 2008). A parallel trend can be seen in the widespread adoption of smart phones and digital technologies. While initially marketed for flexibility and convenience, these technologies have contributed to the intensification of digital consumption, increased energy demand from cloud computing, and a persistent state of connectivity that further reinforces the acceleration of everyday life (Gossart, 2014; Istrate et al, 2024).

Beyond temporal shifts, spatial reorganisations are also driving rebound effects (Ruzzenenti and Basosi, 2008). Changes in infrastructure and urban design reshape

consumption. Research on heating and air conditioning shows how changes in building design and climate control systems have altered expectations of indoor comfort and increased energy demand in previously unheated spaces (Shove, 2003; Walker et al, 2014). Similarly, the expansion of out-of-town shopping centres, enabled by road infrastructure and rises in car ownership, has reshaped retail geographies, encouraging longer shopping trips and greater reliance on cars (Shove and Walker, 2014; Shove et al, 2015; Greene and Rau, 2018; Sonnberger and Gross, 2018). A parallel pattern is evident in digital CE platforms and reuse markets, which, while intended to promote sustainable consumption, often facilitate an expansion rather than a reduction of material exchange (Isenhour et al, 2024; Turunen and Gossen, 2024).

By foregrounding the temporal and spatial dynamics of practice reconfigurations (Wallenborn, 2018), social practice theories reveal that rebounds are not simply a response to increased efficiency, but a systemic outcome of shifting rhythms and spatial arrangements that sustain or amplify material demand. Recognising these dynamics is crucial for designing policies that prevent the unintended intensification of unsustainable consumption patterns (Greene et al, 2024).

Systems of provision

Rebound effects are shaped not only by the ways in which practices are enacted and interlinked, but also by the broader systems of provision in which they are embedded. Systems of provision include the infrastructures, institutions, industries and policies that structure how goods and services are produced, distributed and consumed (Fine, 2002; Fine and Bayliss, 2022). From a practice theoretical perspective, rebounds emerge through the co-evolution of everyday practices and systems of provision, rather than as isolated responses to efficiency improvements (Sonnberger and Gross, 2018). This view helps to explain why efficiency gains often fail to reduce resource use, instead reinforcing or expanding material-intensive lifestyles.

A key insight from social practice theories is that once practices are embedded in provisioning systems, they gain momentum and create structural lock-ins that maintain and expand demand (Spaargaren and van Vliet, 2000; Shove, 2023). These dynamics are particularly evident in transport, housing and energy systems, where rebound effects emerge through long-term infrastructural and socio-economic changes (Urry, 2004; Shove et al, 2015; Kuijer and Watson, 2017).

Many CE policies promote repair, reuse and sharing through rental services, peer-to-peer platforms and repair cafes. However, clothing rental services, framed as sustainable alternatives to fast fashion, may increase material demand rather than reduce it. Zamani et al (2017), for example, show that while rental models extend the life of clothing, their benefits are often offset by transport emissions, frequent laundering and packaging waste (see also Monticelli and Costamagna, 2023). Similarly, access to a shared car leads to financial savings (compared to car ownership), but the financial savings may lead to additional consumption in other areas (Plepys and Singh, 2019).

These cases illustrate that circular consumption practices depend on integration into broader systems of provision. A practice theoretical perspective highlights that without addressing the structural conditions that sustain material-intensive consumption, CE interventions risk shifting material demand rather than reducing it (Sonnberger and Gross, 2018; Aberg and Greene, 2025; Mamkhezri and Khezri, 2024).

Conclusion: Advancing rebound research through social practice theories

Rebound effects remain an under-researched but critical challenge for circular transformations. Where they are considered, they are often framed as behavioural, economic or technological problems, overlooking their embeddedness in social and material systems. This commentary has argued that a social practice perspective offers a more systemic approach, highlighting how rebounds emerge through interconnected practices, temporal and spatial rearrangements, and systems of provision.

Despite the well-established role of social practice theories in sustainable consumption research, their application to rebound effects remains surprisingly limited. This commentary has shown how practice theories can help to conceptualise rebounds as emergent, dynamic phenomena rather than predictable responses to efficiency gains. However, translating these insights into interdisciplinary research remains a challenge. Different disciplines, from sociology and design to environmental science and economics, approach rebounds through distinct frameworks, making integration difficult.

A critical challenge for future research is not only to theorise rebound effects as socio-material phenomena but also to empirically assess their material and systemic consequences. For this, social science perspectives alone are crucial but insufficient; research needs to integrate sociological research with material assessments to track how rebounds unfold in lived practices, rather than assuming that they can only be measured at the level of product life cycles (Suski et al, 2021; 2024).

One promising avenue for advancing this agenda is interdisciplinary research that explores how circular practices evolve within broader socio-material systems. Rather than focusing on CE interventions at the level of individual behaviours or product life cycles, future research must investigate how people integrate circular practices into their daily routines, how infrastructures and regulations shape participation, and how shifts in practice constellations can lead to unintended rebound effects. A key challenge is developing interdisciplinary conceptual-methodological approaches that can capture these dynamics while also assessing their material consequences. As Labanca et al (2020) argue, combining practice-based and complex systems perspectives can illuminate the interdependencies between everyday demand and systemic transformations, offering new ways to conceptualise innovation, sustainability and unintended effects.

As part of this effort, our team is working collaboratively within the ShaRepair Practices project to embed practice-based perspectives into empirical research on rebound effects (ShaRepair Practices, nd). As a five-year interdisciplinary project, it applies a shared practice lens across sociology, design and technical-environmental sciences to examine how sharing and repair practices are taken up in everyday life and how they interact with systems of provision. Through a combination of sociological qualitative research, design interventions and material assessment tools, such as the development of an Environmental Assessment Programme of Social Practices, we aim to develop approaches to identifying and mitigating rebounds in circular consumption.

Although still in its early stages, ShaRepair Practices offers an opportunity to advance practice-based approaches to rebound effects. This commentary is intended as a provocation to develop the field further, calling on researchers, policy makers and practitioners to integrate practice-oriented perspectives into rebound research.

Without considering rebounds as socio-material phenomena, circular transformation strategies risk reinforcing rather than mitigating unsustainable consumption patterns (Greene et al, 2024). To this we call on future research to empirically investigate rebound effects in everyday contexts to ensure that circular policies address systemic consumption dynamics, not just efficiency.

Funding

This work was supported by the Dutch Research Council (NWO) under the Knowledge and Innovation Covenant (KIC) programme [project number KICH1.ED07.22.011].

Conflict of interest

The authors declare that there is no conflict of interest.

References

- Åberg, D. and Greene, M. (2025) Circular plastic consumption in everyday life: a nexus of practice perspective, *Consumption and Society*, 4(2): 170–91, doi: [10.1332/27528499Y2024D000000034](https://doi.org/10.1332/27528499Y2024D000000034)
- Andrew, E.M., Sonnberger, M. and Pigosso, D.C.A. (2024) Expanding the understanding of rebound effects through practice theory: an analytical framework for evaluating sustainability-oriented interventions, *SSRN Electronic Journal*, doi: [10.2139/ssrn.5040798](https://doi.org/10.2139/ssrn.5040798)
- Berkhout, P.H.G., Muskens, J.C. and Velthuisen, J.W. (2000) Defining the rebound effect, *Energy Policy*, 28(6–7): 425–32. doi: [10.1016/S0301-4215\(00\)00022-7](https://doi.org/10.1016/S0301-4215(00)00022-7)
- Druckman, A., Chitnis, M., Sorrell, S. and Jackson, T. (2011) Missing carbon reductions? Exploring rebound and backfire effects in UK households, *Energy Policy*, 39(6): 3572–81, doi: [10.1016/j.enpol.2011.03.027](https://doi.org/10.1016/j.enpol.2011.03.027)
- Fine, B. (2002) *The World of Consumption: The Material and Cultural Revisited*, Routledge.
- Fine, B. and Bayliss, K. (2022) From addressing to redressing consumption: how the system of provision approach helps, *Consumption and Society*, 1(1): 197–206, doi: [10.1332/kdrh7457](https://doi.org/10.1332/kdrh7457)
- Font Vivanco, D. and van der Voet, E. (2014) The rebound effect through industrial ecology's eyes: a review of LCA-based studies, *The International Journal of Life Cycle Assessment*, 19(12): 1933–47, doi: [10.1007/s11367-014-0802-6](https://doi.org/10.1007/s11367-014-0802-6)
- Galvin, R. (2016) Rebound effects from speed and acceleration in electric and internal combustion engine cars: an empirical and conceptual investigation, *Applied Energy*, 172: 207–16, doi: [10.1016/j.apenergy.2016.03.120](https://doi.org/10.1016/j.apenergy.2016.03.120)
- Galvin, R. and Gubernat, A. (2016) The rebound effect and Schatzki's social theory: reassessing the socio-materiality of energy consumption via a German case study, *Energy Research & Social Science*, 22: 183–93, doi: [10.1016/j.erss.2016.08.024](https://doi.org/10.1016/j.erss.2016.08.024)
- Geng, L., Cheng, X., Tang, Z., Zhou, K. and Ye, L. (2016) Can previous pro-environmental behaviours influence subsequent environmental behaviours? The licensing effect of pro-environmental behaviours, *Journal of Pacific Rim Psychology*, 10: e9, doi: [10.1017/prp.2016.6](https://doi.org/10.1017/prp.2016.6)
- Gneezy, U., Imas, A. and Madarász, K. (2014) Conscience accounting: emotion dynamics and social behavior, *Management Science*, 60(11): 2645–58, doi: [10.1287/mnsc.2014.1942](https://doi.org/10.1287/mnsc.2014.1942)
- Gossart, C. (2014) Rebound effects and ICT: a review of the literature, in L.M. Hilty and B. Aebischer (eds) *ICT Innovations for Sustainability*, Springer, pp 435–48.

- Greene, M. (2017) *Energy Biographies: Exploring the Intersections of Lives, Practices and Contexts*, PhD thesis, University of Galway.
- Greene, M. (2018) Socio-technical transitions and dynamics in everyday consumption practice, *Global Environmental Change*, 52: 1–9, doi: [10.1016/j.gloenvcha.2018.05.007](https://doi.org/10.1016/j.gloenvcha.2018.05.007)
- Greene, M. and Rau, H. (2018) Moving across the life course: the potential of a practice approach to mobility transition, *Journal of Consumer Culture*, 18(1): 60–78, doi: [10.1177/1469540516634417](https://doi.org/10.1177/1469540516634417)
- Greene, M., Hobson, M. and Jaeger-Erben, M. (2024) Bring the circular economy home – Insights from socio-technical perspectives on everyday consumption, *Cleaner and Responsible Consumption*, 12: 100157, doi: [10.1016/j.clrc.2023.100157](https://doi.org/10.1016/j.clrc.2023.100157)
- Greening, L.A., Greene, D.L. and Difiglio, C. (2000) Energy efficiency and consumption – the rebound effect – a survey, *Energy Policy*, 28(6–7): 389–401. doi: [10.1016/S0301-4215\(00\)00021-5](https://doi.org/10.1016/S0301-4215(00)00021-5)
- Hand, M. and Shove, E. (2007) Condensing practices: ways of living with a freezer, *Journal of Consumer Culture*, 7(1): 79–104, doi: [10.1177/1469540507073509](https://doi.org/10.1177/1469540507073509)
- Hand, M., Shove, E. and Southerton, D. (2005) Explaining showering: a discussion of the material, conventional, and temporal dimensions of practice, *Sociological Research Online*, 10(2), doi: [10.5153/sro.1100](https://doi.org/10.5153/sro.1100)
- Isenhour, C., Berry, B. and Scruton, E. (2024) Rethinking replacement, rebound and environmental impact in reuse practice, *Consumption and Society*, Advance online publication, doi: [10.1332/27528499y2024d000000036](https://doi.org/10.1332/27528499y2024d000000036)
- Istrate, R., Tulus, V., Grass, R.N., Vanbever, N., Stark, W.J. and Guillén-Gosálbez, G. (2024) The environmental sustainability of digital content consumption, *Nature Communications*, 15: 3724, doi: [10.1038/s41467-024-47621-w](https://doi.org/10.1038/s41467-024-47621-w)
- Jalas, M. (2009) Time-use rebound effects: an activity-based view of consumption, in H. Herring and S. Sorrell (eds) *Energy Efficiency and Sustainable Consumption: The Rebound Effect*, Palgrave Macmillan, pp 167–84.
- Khazzoom, J.D. (1989) Energy savings from more efficient appliances: a rejoinder, *The Energy Journal*, 10(1): 157–66.
- Klößner, C.A., Nayum, A. and Mehmetoglu, M. (2013) Positive and negative spillover effects from electric car purchase to car use, *Transportation Research Part D: Transport and Environment*, 21: 32–8.
- Kuijjer, L. and Watson, M. (2017) ‘That’s when we started using the living room’: lessons from a local history of domestic heating in the United Kingdom, *Energy Research & Social Science*, 28: 77–85, doi: [10.1016/j.erss.2017.04.010](https://doi.org/10.1016/j.erss.2017.04.010)
- Labanca, N., Guimarães Pereira, Â., Watson, M., Krieger, K., Padovan, D., Watts, L., et al (2020) Transforming innovation for decarbonisation? Insights from combining complex systems and social practice perspectives, *Energy Research & Social Science*, 65: 101452, doi: [10.1016/j.erss.2020.101452](https://doi.org/10.1016/j.erss.2020.101452)
- Makov, T. and Vivanco, D.F. (2018) Does the circular economy grow the pie? The case of rebound effects from smartphone reuse, *Frontiers in Energy Research*, 6: 39. doi: [10.3389/fenrg.2018.00039](https://doi.org/10.3389/fenrg.2018.00039)
- Mamkhezri, J. and Khezri, M. (2024) Vehicle miles traveled induced demand, rebound effect, and price and income elasticities: a US spatial econometric analysis, *Transport Policy*, 158: 224–40, doi: [10.1016/j.tranpol.2024.09.023](https://doi.org/10.1016/j.tranpol.2024.09.023)
- Mattioli, G., Anable, J. and Vrotsou, K. (2016) Car dependent practices: findings from a sequence pattern mining study of UK time use data, *Transportation Research Part A: Policy and Practice*, 89: 56–72, doi: [10.1016/j.tra.2016.04.010](https://doi.org/10.1016/j.tra.2016.04.010)

- Middha, B., Torabi, N., Maller, C., Lockrey, S., Stasinopoulos, P. and Shiwakoti, N. (2025) Freezing time, freezing in time: reconfiguring freezing practices for reducing meat waste and energy consumption, *Consumption and Society*, 4(2): 192–212, doi: [10.1332/27528499y2024d0000000038](https://doi.org/10.1332/27528499y2024d0000000038)
- Mizobuchi, K. and Yamagami, H. (2022) Time rebound effect in households' energy use: theory and evidence, *Cleaner and Responsible Consumption*, 5: 100066, doi: [10.1016/j.clrc.2022.100066](https://doi.org/10.1016/j.clrc.2022.100066)
- Monticelli, D. and Costamagna, F. (2023) Rental fashion business models and their environmental implications: a systematic review, *Sustainable Horizons*, 5: 100058, doi: [10.1007/s10668-022-02363-x](https://doi.org/10.1007/s10668-022-02363-x)
- Nash, N., Whitmarsh, L., Capstick, S., Hargreaves, T., Poortinga, W., Thomas, G., et al (2017) Behavioural spillover in the UK: evidence, implications and directions for future research, *Wiley Interdisciplinary Reviews: Climate Change*, 8(6): e481, doi: [10.1002/wcc.481](https://doi.org/10.1002/wcc.481)
- Plepyś, A. and Singh, J. (2019) Evaluating the sustainability impacts of the sharing economy using input–output analysis, in F. Mont and M. Lehner (eds) *A Research Agenda for Sustainable Consumption Governance*, Edward Elgar Publishing, pp 66–84.
- Reimers, H., Jacksohn, A., Appenfeller, D., Lasarov, W., Hüttel, A., Rehdanz, K., et al (2021) Indirect rebound effects on the consumer level: a state-of-the-art literature review, *Cleaner and Responsible Consumption*, 3: 100032, doi: [10.1016/j.clrc.2021.100032](https://doi.org/10.1016/j.clrc.2021.100032)
- Reckwitz, A. (2002) Toward a theory of social practices: a development in culturalist theorizing, *European Journal of Social Theory*, 5(2): 243–63, doi: [10.1177/13684310222225432](https://doi.org/10.1177/13684310222225432)
- Rosa, H. (2013) *Social Acceleration: A New Theory of Modernity*, Columbia University Press.
- Ruzzenenti, F. and Basosi, R. (2008) The rebound effect: an evolutionary perspective, *Ecological Economics*, 67(4): 526–37, doi: [10.1016/j.ecolecon.2008.08.001](https://doi.org/10.1016/j.ecolecon.2008.08.001)
- Ruzzenenti, F., Font Vivanco, D., Galvin, R., Sorrell, S., Wagner, A. and Walnum, H.J. (2019) The rebound effect and the Jevons' paradox: beyond the conventional wisdom, *Frontiers in Energy Research*, 7: 90. doi: [10.3389/fenrg.2019.00090](https://doi.org/10.3389/fenrg.2019.00090)
- Schatzki, T.R. (2002) *The Site of the Social: A Philosophical Account of the Constitution of Social Life and Change*, The Pennsylvania State University Press.
- Schor, J. (1992) *The Overworked American: The Unexpected Decline of Leisure*, Basic Books.
- Schor, J. (2005) Sustainable consumption and worktime reduction, *Journal of Industrial Ecology*, 9(1–2): 37–50, doi: [10.1162/1088198054084581](https://doi.org/10.1162/1088198054084581)
- ShaRepair Practices (nd) ShaRepair practices, <https://sharepairpractices.nl/>.
- Shove, E. (2003) *Comfort, Cleanliness and Convenience: The Social Organization of Normality*, Berg Publishers.
- Shove, E. (2023) *Connecting Practices: Large Topics in Society and Social Theory*, Routledge.
- Shove, E. and Walker, G. (2014) What is energy for? Social practice and energy demand, *Theory, Culture & Society*, 31(5): 41–58, doi: [10.1177/0263276414536746](https://doi.org/10.1177/0263276414536746)
- Shove, E. and Trentmann, F. (eds) (2019) *Infrastructures in Practice: The Dynamics of Demand in Networked Societies*, Routledge.
- Shove, E., Trentmann, F. and Wilk, R. (eds) (2009) *Time, Consumption and Everyday Life: Practice, Materiality and Culture*, Bloomsbury Publishing.
- Shove, E., Pantzar, M. and Watson, M. (2012) *The Dynamics of Social Practice: Everyday Life and How it Changes*, SAGE.

- Shove, E., Watson, M. and Spurling, N. (2015) Conceptualizing connections: energy demand, infrastructures, and social practices, *European Journal of Social Theory*, 18(3): 274–87, doi: [10.1177/1368431015579964](https://doi.org/10.1177/1368431015579964)
- Sonnberger, M. and Gross, M. (2018) Rebound effects in practice: an invitation to consider rebound from a practice theory perspective, *Ecological Economics*, 154: 14–21, doi: [10.1016/j.ecolecon.2018.07.013](https://doi.org/10.1016/j.ecolecon.2018.07.013)
- Sorrell, S., Dimitropoulos, J. and Sommerville, M. (2009) Empirical estimates of the direct rebound effect: a review, *Energy Policy*, 37(4): 1356–71, doi: [10.1016/j.enpol.2008.11.026](https://doi.org/10.1016/j.enpol.2008.11.026)
- Southerton, D. (2013) Habits, routines and temporalities of consumption: from individual behaviours to the reproduction of everyday practices, *Time & Society*, 22(3): 335–55, doi: [10.1177/0961463x12464228](https://doi.org/10.1177/0961463x12464228)
- Spaargaren, G. and van Vliet, B.J.M. (2000) Lifestyles, consumption and the environment: the ecological modernisation of domestic consumption, *Environmental Politics*, 9(1): 50–77, doi: [10.1080/09644010008414512](https://doi.org/10.1080/09644010008414512)
- Spielmann, M., Laurenti, R., Mela, H. and Gilardi, E. (2008) Rebound effects of energy efficiency improvements: a critical review of past and present findings, *Journal of Cleaner Production*, 16(11): 1175–83, doi: [10.1016/j.jclepro.2007.08.001](https://doi.org/10.1016/j.jclepro.2007.08.001)
- Spurling, N. and McMeekin, A. (2014) Interventions in practices: sustainable mobility policies in England, in Y. Strengers and C. Maller (eds) *Social Practices, Intervention and Sustainability: Beyond Behaviour Change*, Routledge, pp 78–94.
- Strengers, Y. and Maller, C. (eds) (2014) *Social Practices, Intervention and Sustainability: Beyond Behaviour Change*, Routledge, doi: [10.4324/9781315816494](https://doi.org/10.4324/9781315816494)
- Suski, P., Speck, M. and Liedtke, C. (2021) Promoting sustainable consumption with LCA: a social practice-based perspective, *Journal of Cleaner Production*, 283: 124573, doi: [10.1016/j.jclepro.2020.125234](https://doi.org/10.1016/j.jclepro.2020.125234)
- Suski, P., Augenstein, K. and Greiff, K. (2024) Life cycle assessment of consumption patterns: understanding the links between changing social practices and environmental impacts, *Journal of Cleaner Production*, 477: 143813, doi: [10.1016/j.jclepro.2024.143813](https://doi.org/10.1016/j.jclepro.2024.143813)
- Thøgersen, J. (1999) Spillover processes in the development of a sustainable consumption pattern, *Journal of Economic Psychology*, 20: 53–81, doi: [10.1016/s0167-4870\(98\)00043-9](https://doi.org/10.1016/s0167-4870(98)00043-9)
- Truelove, H.B., Carrico, A.R., Weber, E.U., Raimi, K.T. and Vandenberg, M.P. (2014) Positive and negative spillover of pro-environmental behavior: an integrative review and theoretical framework, *Global Environmental Change*, 29: 127–38, doi: [10.1016/j.gloenvcha.2014.09.004](https://doi.org/10.1016/j.gloenvcha.2014.09.004)
- Truelove, H.B., Yeung, K.L., Carrico, A.R., Gillis, A.J. and Raimi, K.T. (2016) From plastic bottle recycling to policy support: an experimental test of pro-environmental spillover, *Journal of Environmental Psychology*, 46: 55–66, doi: [10.1016/j.jenvp.2016.03.004](https://doi.org/10.1016/j.jenvp.2016.03.004)
- Turunen, L.L.M. and Gossen, M. (2024) From preloved to reloved: how second-hand clothing companies facilitate the transaction of used garments, *Journal of Sustainability Research*, 6(1): e240002, doi: [10.20900/jsr20240002](https://doi.org/10.20900/jsr20240002)
- Urry, J. (2004) The ‘system’ of automobility, *Theory, Culture & Society*, 21(4–5): 25–39, doi: [10.1177/0263276404046059](https://doi.org/10.1177/0263276404046059)
- Wallenborn, G. (2015) The tragedy of energy efficiency: an interdisciplinary analysis of rebound effects, *ECEEE Summer Study Proceedings*, 133–44.

- Wallenborn, G. (2018) Rebounds are structural effects of infrastructures and markets, *Frontiers in Energy Research*, 6: 99, doi: [10.3389/fenrg.2018.00099](https://doi.org/10.3389/fenrg.2018.00099)
- Walker, G., Shove, E. and Brown, S. (2014) How does air conditioning become 'needed'? A case study of routes, rationales, and dynamics, *Energy Research & Social Science*, 4: 1–10, doi: [10.1016/j.erss.2014.08.002](https://doi.org/10.1016/j.erss.2014.08.002)
- Warde, A. (2005) Consumption and theories of practice, *Journal of Consumer Culture*, 5(2): 131–53, doi: [10.1177/1469540505053090](https://doi.org/10.1177/1469540505053090)
- Zamani, B., Sandin, G. and Peters, G.M. (2017) Life cycle assessment of clothing libraries: can collaborative consumption reduce the environmental impact of fast fashion?, *Journal of Cleaner Production*, 162: 1368–75, doi: [10.1016/j.jclepro.2017.06.128](https://doi.org/10.1016/j.jclepro.2017.06.128)