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EDITED BY  
Henrike Rau,  
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REVIEWED BY  
Atle Wehn Hegnes,  
Oslo Metropolitan University, Norway  
Julien Walzberg,  
National Renewable Energy Laboratory  
(DOE), United States

\*CORRESPONDENCE  
Matthias Lehner  
matthias.lehner@iiee.lu.se

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# Sustainable consumption through policy intervention—A review of research themes

Oksana Mont, Matthias Lehner\* and Carl Dalhammar

Faculty of Engineering (LTH), International Institute for Industrial Environmental Economics, Lund University, Lund, Sweden

Policy-makers are starting to acknowledge the urgent need for policy-intervention to achieve sustainable consumption. However, it is difficult to achieve policy-making that leads to impactful consumption interventions. Generally speaking, sustainable consumption can be achieved in three ways; to reduce consumption, to change consumption, and to improve consumption. These strategies all have their advantages and disadvantages regarding the likelihood for impactful policies to be implemented. Prior research identifies policies with big impact potential for all three of these strategies, but also clearly shows that none of the three strategies has so far been successfully applied to achieve sustainable consumption. Indeed, success remains elusive in each of the strategies to adopt the most impactful policies available due to limited implementability. The goal of this article is to provide a broad overview of research on sustainable consumption and to discuss future directions for research.

## KEYWORDS

sustainable consumption, policy intervention, policy package, reduce, change, improve

## Introduction

The ongoing environmental crisis and the growing socio-economic disparities between different population groups are among humanity's greatest challenges. These problems stem from the unsustainable patterns of consumption we find in societies all over the world, especially in the more affluent sections of the population (Wiedmann et al., 2020). International agreements such as the 2030 Agenda and the Paris Agreement set ambitious goals and strategies for more sustainable societies. Goal 12 of the UN Sustainable Development Agenda 2030 (SDG 12) calls for responsible consumption and production, which aims to “do more and better with less” to improve quality of life and to leave no one “behind” (UN DESA, 2016). But the question is whether it is possible to achieve the profound systemic changes needed to address the negative consequences of human activities in less than a decade (Alfredsson et al., 2018).

Introducing an effective policy mix for sustainable consumption is a huge task. A sustainable level of consumption will ensure a dignified life for the entire population of the world (Raworth, 2012, 2017) within planetary boundaries (Rockström et al., 2009; Steffen et al., 2015). Some argue that this is only possible by reducing growth (Kallis, 2019). Given the level of necessary upheaval to current living standards most people in

the West would have to forgo in terms of income and consumption (Milanovic, 2021), this is hardly something that can be achieved without profound social change and a new approach to consumption—where we need to rethink our attitudes about lifestyles and the role of consumption in our lives, quality of life, and the “good life.” Therefore, much broader societal dialogue, visions of the future and roadmaps are needed for a transformative change that has an absolute decoupling between consumption and environmental impact as a starting point—or even as an absolute condition—for the future development toward sustainable consumption and sustainable lifestyles.

While policy-makers have identified the importance of consumption to limit carbon emissions, consumption-oriented environmental policy-making has remained largely unsuccessful in bending the trend of increased consumption-related carbon emissions. This is despite an abundance of policy-tools available. However, sustainable consumption is also a politically sensitive policy arena as it challenges the status quo, and therefore also the reigning consumer paradigm as well as powerful economic interests. Policies that are easy to implement often have limited impact. Thus, policy-making for sustainable consumption currently stands at an impasse where policies often appear to be either impactful or implementable, but rarely both.

## Sustainable consumption as an environmental policy arena

The development of policies and the research discourse on sustainable consumption are intertwined with policy developments in sustainable production. Unsustainable consumption and production patterns were identified as the main cause of environmental degradation already at the Rio Earth Summit in 1992, when Agenda 21 and the Rio Declaration were signed by more than 178 governments as non-binding action plans for sustainable development (UNCED, 1992). These were revised in 2002, at the Johannesburg World Summit for Sustainable Development, where sustainable consumption and production were adopted as a key goal and requirement for sustainable development (UN, 2002). There, the decision was taken to establish a 10-year framework for programmes in support of regional and national initiatives to accelerate the transition to sustainable consumption and production (10YFP). In 2015, UN member states set the 17 Global Goals and 169 detailed SDGs intended to be achieved by 2030. Objective eight aims to decouple economic growth from resource use and environmental degradation, in particular through improved resource efficiency, while maintaining people’s well being (UN DESA, 2016). SDG 12 calls for a shift to sustainable consumption and production in developed and developing countries, which is mostly about doing more and better with less resources. The Paris Agreement, which entered into force

in 2016, commits all countries that have signed and ratified the agreement to implement measures to keep the temperature increase well below two degrees from 2020 onwards. The agreement stipulates that “sustainable lifestyles and sustainable consumption and production patterns play an important role in addressing climate change.” One of the main objectives of the new UN Consumer Protection Guidelines of 2016 was also to promote sustainable consumption.

Sustainable consumption as an environmental policy area is cross-sectoral, which means that it has not had a natural political home. It has been considered to be at the intersection of consumer and environmental policy (Mont and Dalhammar, 2005). Sustainable consumption is thus a relevant issue both for those who work with consumer issues and those who deal with environmental issues. It concerns strategies and policy instruments in many different environmental policy areas, which means “administrative fragmentation”<sup>1</sup> with regard to different geographical scales, time scales, as well as specific problem areas, as well as the interaction between different areas such as national vs. local governance (Heiskanen et al., 2014). There is a plethora of policy instruments that relate to consumption, in different ways, and they can be adopted at different levels (both at the EU level, nationally and locally). The policy instruments and laws relating to sustainable consumption are under different directorates-general of the European Commission. We also see how new environmental policy areas such as Circular Economy have a strong element of consumption-oriented measures (“right to repair,” product labeling, long-lived products, etc.), and how recommendations to make economies more “circular” include many measures that aim to reduce or change consumption (Circle Economy RISE, 2022).

The implications of the above include:

- It is not easy to separate a policy of sustainable consumption, or instruments for sustainable consumption, from other environmental policy areas.
- Many environmental policy areas, such as climate policy and the work toward a circular economy, are increasingly focusing on consumer issues.

It is an open question whether “sustainable consumption” should be treated as its own area of sustainability policy, with its own objectives, or whether consumption issues should be integrated into other policy areas. Right now, the situation is that many nations that work actively with sustainable consumption simultaneously apply both of these strategies.

This article sets out to map current literature streams in order to identify policy-making that allows for the successful implementation of impactful consumption-oriented action and point to future research needs to identify the

<sup>1</sup> For a discussion of the term see for example (Scharin, 2018).

TABLE 1 Different ways to categorize steps in the transition to sustainable consumption.

Our terminology	UNEP (2001)	Geels et al. (2015)	Creutzig et al. (2018)	Akenji et al. (2021)
Improve	Different	Reformist	Enhance	Improve
Change	Conscious	Reconfiguration	Shift	Shift
Reduce	Appropriate	Revolutionary	Avoid	Reduce

best policy-mixes for successful policy-making in achieving sustainable consumption.

## Materials and methods

The method for this paper can be described as an integrative literature analysis. Integrative literature analysis is a form of research that examines, criticizes, and synthesizes representative literature on a specific topic in an integrated way so that new conceptual frameworks and perspectives are generated (Torraco, 2005). Literature searches using relevant keywords have been done in Scopus, Web of Science, Google Scholar, and LUBSearch. Keywords in English and Swedish have been used, including e.g., “sustainable consumption,” “weak and strong sustainable consumption” and specific areas described in various sections, such as “sufficiency,” “segmentation,” “advertising,” “social innovation,” “eco-label,” “de-growth,” “sustainable lifestyles,” etc. Keywords have included: [TITLE-ABS-KEY (“sustainable consumption”) AND ALL (meta-analysis) OR TITLE-ABS-KEY (“systematic literature review”) AND TITLE-ABS-KEY (policy)]. Searches have also been carried out through relevant websites and databases, e.g., the Swedish Environmental Protection Agency, the Nordic Council of Ministers, the OECD, the European Commission and others. In order to make the task more manageable, meta-studies as well as studies where a systematic literature analysis has been carried out, have been used. For specific subcategories—such as the collaborative economy, circular economy, sustainable business models, nudging, etc.—specific searches for relevant keywords have been conducted within each section.

## Results

### The current state of research on sustainable consumption

Several strategies have been proposed to achieve sustainable consumption. Most classifications of them distinguish three levels. For example, an influential UNEP report from 2001 distinguished between “different” consumption to be achieved through government measures and investments, “conscious” consumption to be achieved through changes in consumer behavior, and “appropriate” consumption to be achieved

through a deep and broad debate in society about consumption patterns and levels of consumption, as well as quality of life (UNEP, 2001). Another conceptualization is the avoid-shift-enhance framework like Creutzig et al. (2018) propose. These were developed in the early 1990s in Germany, to structure policies that reduce the environmental impact of transportation. When it comes to the study of transition processes toward sustainability, Geels et al. (2015) suggest a distinction should be made between reformist, reconfigured and revolutionary approaches. Akenji et al. (2021) distinguish between reduce-shift-improve as different options for change toward a lifestyle that can be reconciled with the 1.5-degree goal. In Table 1 we summarize the concepts and how we use them in this article.

Improve—means that individuals consume better alternatives of the same goods and services they already consume, e.g., eco-labeled, organic, energy-efficient, ethical or locally produced goods. Better consumption is about the consumption of more environmentally efficient or socially sustainable goods and services, which are produced and consumed within the framework of the current technological paradigm. Environmental problems are solved through “green” innovation and improvement of products and production processes (McMeekin and Southerton, 2012).

Change—means relative decrease in the influence of consumption due to a shift to other means of consumption, e.g., switching to a less burdensome category of goods and services, instead of driving a car, using public transportation, or instead of eating meat, eating plant proteins. Another example is switching to different business models, such as from buying, owning and using a private car to accessing a shared car, car pool or car rental service.

Reduce—means absolute reduction in the volume of consumption of goods and services leading to an absolute reduction in the consumption of resources and thus an absolute reduction in environmental and social impact. Reduced consumption can be, for example, when individuals reduce food waste, change their fashion habits, fly less, refrain from cars, and live in smaller homes.

Sustainable consumption patterns and levels can probably be achieved only with a combination of these three perspectives, where (1) we consume increasingly efficient products and services (improve), (2) we find more innovative and diverse ways to satisfy our needs and wants

(change), and (3) we refrain from certain consumption (reduce) (Akenji et al., 2021).

In the following we will review the state of academic discussion regarding all three strategies.

## Improve—Better consumption

Better consumption is about the consumption of more environmentally efficient or socially sustainable goods and services, which are produced and consumed within the framework of the prevailing technological paradigm. Environmental problems are solved through “green” innovation and improvement of products and production processes (McMeekin and Southerton, 2012). To stimulate the consumption of these eco-efficient products, consumers must make green purchasing decisions. This can be achieved with the help of information, eco-labeling, nudging, and consumer campaigns. Many of the research disciplines that contribute to the discourse of effective sustainable consumption—behavioral sciences, psychology and social psychology, marketing, behavioral economics, economics, and political sciences—often see the individual as the main culprit behind unsustainable consumption, as well as the main agent of change (Devinney et al., 2010; Mont et al., 2013). Politicians and other actors, including companies and academics, are seen as agents who are there to help individuals to change behavior (Devinney et al., 2010).

### Example 1: Green markets and consumers

To better understand the individual's role in green consumption, research has focused on studying demographic parameters such as gender and income, which have a major impact on consumption patterns and sustainability impact. A recent study of spending by single men and women showed that men's purchases created 16% higher emissions even though the subjects in the study spent similar sums of money (Carlsson Kanyama et al., 2021). This is because men spend 70% more on categories with high emissions, such as petrol, while women spend more on consumer categories that have a less environmental impact, such as health care, clothing, and furniture. This is in line with the results of previous studies which show that women live in a more sustainable way than men (Bradley, 2009), and place more value on efficient energy use, waste sorting and recycling than men (Konsumentverket, 2020).

Income has proven to be an important indicator of household consumption-related environmental impact (Hubacek et al., 2017). A study from Israel shows how the consumption patterns of poor and rich individuals differ (Peleg-Mizrachi and Tal, 2020): poorer Israelis have a larger ecological footprint per capita in their purchases of textiles and food consumption, while richer Israelis have a relatively

larger ecological footprint in transport and housing. Globally, the richest 10% in the world accounted for 49% of emissions in 2015, while the 50% with the lowest income accounted for 7%. Emissions increased between 1990 and 2015, and this increase was overwhelming among the part of the world's highest-income population (Kartha et al., 2020). Therefore, a general approach to how to bring about behavior change is misguided, since the responsibility for the majority of emissions is so strongly concentrated in the hands of a few powerful individuals, referred to by Kenner (2019) as the “polluting elite.” These top consumers use their significant economic and political influence to maintain the unsustainable and unfair system that underpins our economy (Wiedmann et al., 2020).

With regard to instruments for sustainable consumption, research points to the importance of developing instruments that are adapted to specific groups of people (Akenji et al., 2021; Newell et al., 2021b). An important issue for future research is the acceptance of various instruments. The Eurobarometer shows that more than half (51%) of Swedish consumers believe that technical solutions are more effective in tackling environmental problems, 40% believe that changing ways of consuming is more effective, followed by 33% who believe in stronger economic incentives to protect the environment (EC, 2020). An important question to ask in future research is whether individuals will support measures to reduce consumption. Research needs to understand why we consume as we do, but there is also a need for more research on what can make us refrain from consuming more (Lorek and Fuchs, 2019).

### Example 2: Communication and advertising

Various branches of marketing have emerged that aim to promote green or sustainable consumption (see for example Belz and Peattie, 2012; Guyader et al., 2020). Overall, research on sustainability marketing focuses on integrating sustainability into marketing, but is less likely to delve into consumers' lifestyles or behavioral changes (Kemper and Ballantine, 2019). There are still few studies in marketing that acknowledge that the consumption patterns that conventional marketing encourages are an important driving force for negative environmental impact (Peattie and Peattie, 2009). According to Izagirre-Olaizola (2021), green marketing is also a tool for selling only certain types of eco-labeled products, rather than a tool for tackling the root of the environmental problem—consumption dependency. Criticism of marketing has therefore increased and researchers have begun to ask critical questions about the role of marketing in a society characterized by environmental degradation (Brownlie and Tadajewski, 2008; Firat and Tadajewski, 2010; Nair and Little, 2016). Yet there is more research, at least in traditional academic journals, on marketing that studies how to promote consumerism, than those that focus on marketing restrictions, and how consumerism can be curbed (McDonagh and Prothero, 2014). This can

be explained by the fact that there are powerful actors who benefit from current levels of mass consumption and various attempts to change consumption patterns may end up in open conflict with their interests (Fischer et al., 2021). But there are proposals to, for example, introduce a tax on advertising or ban the advertising of unsustainable goods, for example by banning phrases that give the impression that a product's impact on the environment is minimal, and requirements that advertising must contain information on how to take care of and repair a product, or a requirement that certain environmental information must be included in all advertising, e.g., what energy consumption a product has (Dalhammar et al., 2021b).

### Example 3: Choice editing and nudging

There is a growing volume of “marketing noise” from companies and brands, making it difficult for consumers to choose the right brand and product (Owen et al., 2007). This, combined with consumers' limited opportunities to control the messages, has led to an increased interest in research on “greenwashing.” Greenwashing is about the practice of presenting false or exaggerated sustainability claims (Guyader et al., 2020) or using environmental messages to divert attention from less desirable behaviors (Pezzullo and Cox, 2018). A recent EU-wide review of sustainability claims online, from various business sectors such as clothing, cosmetics and household equipment, shows that in 42% of cases they were exaggerated, false or misleading, and potentially some of them could be classified as unfair business practices (European Commission, 2021). Despite some countries having started to introduce legislation to counteract this problem, unfounded sustainability claims still represent a problem in marketing (Dalhammar, 2020).

Nudging is one of the instruments proposed to reach consumers who need help in making consumption choices but do not have the time or interest to inform themselves (Ahlner and Carlsson, 2015). Nudging is most effective if the individual agrees that the encouraged behavior is desirable, and gives a better effect in terms of reducing bad behavior if the individual already wants to change the behavior (Thaler and Sunstein, 2008). This shows the importance of combining nudging with other measures such as information/education, to build the foundation for nudging to work and be accepted. To increase the usefulness of nudging, research on evaluation methods is needed to measure its effect because it is a very context-dependent tool (Gravert and Carlsson, 2019).

### Overall shortcomings of tools for better consumption

“Better consumption” falls within the framework of the existing economic system as it does not question economic growth but focuses on making it less burdensome in terms of

environmental and social impact. More efficient consumption is seen as a way to reduce environmental and social impact, but the potential of the strategy to achieve environmental sustainability is considered limited to address the urgency and scale of the environmental problems humanity is facing (Newell et al., 2021b). This potential becomes even smaller due to rebound effects at the individual- (Hertwich, 2002) and societal level (Herring and Sorell, 2009). Rebound effects in relation to “better consumption” mean that increased efficiency of products can lead to (i) increased use of greener products when they become more efficient and cheaper or (ii) an increase in consumption of other goods, which can be bought from savings from efficiency gains (see Walzberg et al., 2020). An example of a rebound effect concerns light bulbs. When they are replaced by more energy-efficient LED lamps, both the purchases and the use of LED lamps increase, which leads to increased total energy consumption for lighting. Another example is when increased efficiency leads to price reductions or other reduced costs, which helps the consumer save money which is then spent on more environmentally damaging activities, such as air or car travel. Both types of rebound effects can lead to an absolute increase in resource use and emissions instead of a decrease. A recent meta-study shows that a majority of the empirical studies estimate that the rebound effects on the economy as a whole are at least 50% or more (Brockway et al., 2021). This means that half of the potential energy savings from improved energy efficiency are “eaten up” due to various economic and behavioral consequences.

Instruments for “better consumption” have been criticized for limited efficiency and a partial explanation may be the narrow view of human behavior with a focus on either rational argument, such as economic gains, or subjective emotions, such as pleasure. In order to achieve sustainable consumption patterns, and especially levels, changes in society's social, institutional and structural system changes must take place (Jackson, 2009). It is therefore important to better understand the dynamics of various societal and economic systems in relation to consumption and its impact on sustainability.

### Change—Consumption shift

The “change” perspective argues for transitions in different socio-technical systems, such as supply systems in different sectors, in business models and changes in social practices. Consumption shifts focus on the meso-level, where different systems and their components are studied. Several theories such as MLP (multi-level perspective) and social practice theory have a common focus on heterogeneous configurations of system components. “Changed” consumption is based on a number of different disciplines, primarily human geography, management, science and technology studies, and sociology. Proponents of this perspective argue that the “better consumption” perspective

has failed to appreciate the integrated role that social and structural contexts play in shaping and limiting behaviors (Van Vliet et al., 2005; Spaargaren et al., 2006; Shove and Walker, 2010) According to Geels et al. (2015) the strategy has greater sustainability potential than the strategy “better consumption.”

### Example 1: Social practices

Social practice theory was developed to analyze everyday practices in the socio-technical environment (Røpke, 2009). The theory provides an opportunity to go beyond the in Sociology otherwise dominant “dualism” of structure *versus* agency, (see for example Giddens, 1984). Social practice theory can also be fruitful in studies of consumption in relation to environmental and sustainability aspects (Røpke, 2009). Social practice theories emphasize aspects of consumption that tend to be overlooked in traditional theories of consumption. For example, the focus is on the practice of doing rather than having in relation to consumption (Shove et al., 2007). The idea of the rational and responsible consumers that propagate the neoclassical economic model is challenged in social practice theory by the concept of “distributed agency in social practices” (Sahakian and Wilhite, 2014). This means that in order to understand consumption, different selection processes must be studied that are affected by the cognitive processes and physical (body-related) conditions, as well as the material context, the social dimensions that contribute to social learning. By analyzing the links between routine everyday behavior and the greater socio-technical development (Giddens, 1984; Schatzki et al., 2001), opportunities to reduce consumption-related impact can potentially be identified (Warde et al., 2002; Sahakian and Wilhite, 2014).

Social practice theory has been used to study socio-technical systems and consumer behavior in several areas, such as energy (Gram-Hanssen, 2011; J alas et al., 2017; Jensen, 2017), hygiene (Shove, 2003; Gram-Hanssen, 2007), transport (Hesselgren et al., 2020; Sopjani et al., 2020; Svennevik et al., 2020), and food (Leray et al., 2016; Plessz et al., 2016). Theoretically, they have bridged various aspects of socio-technical transitions (Watson, 2012; Chilvers et al., 2018), while other studies looked at how interconnected practitioners play into socio-technical change (Shove et al., 2012; Rosenbloom, 2017; Boamah and Rothfuß, 2018; Greene, 2018) and how technologies are embedded in practitioners (Sahakian and Wilhite, 2014; Järvensivu, 2017). Social practice theories were applied in research on the development and stability of social practices (Hargreaves et al., 2013; Southerton, 2013), as well as on how practices are intertwined in different contexts of consumption (Powells et al., 2014; Vlasova and Gram-Hanssen, 2014; Fonte and Quieti, 2018).

A proposal from social practice theory for decision-makers is to expand the range of processes to “scale up” sustainable consumption behaviors. By first identifying practices that are

already changing, and by introducing instruments to strengthen them, the upscaling effect can be achieved by bridging different communities of practice and sharing learning opportunities across different contexts. Spaargaren (2011) suggests that social practice theory can strengthen the governance of sustainable consumption in three ways: by specifying roles and assigning responsibilities to people in addition to traditional shopping practices, by recognizing the role of objects, technologies and infrastructures in transitions to a more sustainable economy, and by enriching the cultural framework of sustainability by studying common practices for sustainable consumption.

### Example 2: Business models

In societies characterized by consumer culture, new business models have emerged that are based on ideas of circularity (Geissdoerfer et al., 2017; Mont et al., 2019; Henry et al., 2020; Schwanholz and Leipold, 2020). Research on these business models is diverse and covers issues of innovation, acceptance, user participation, business model configurations, and sustainability assessments. In these business models, the role of citizens/consumers changes from being a buyer to becoming, among other things, a supplier, manager, lender, repairer, or asset manager (Maitre-Ekern and Dalhammar, 2019). In addition to studying consumer acceptance of these business models, they have been studied using social practice theory (Huber, 2017; Philip et al., 2019). Research on business model configurations has advanced toward studying the development of the business models’ ecologies, where different actors interact and contribute to a process of social change beyond the business models themselves (Boons and Bocken, 2018). Transition theory has been applied in studies of sustainable business models (Guo et al., 2019; Lee et al., 2020) to understand their evolution and upscaling. Companies that use such business methods face several obstacles arising from the current socio-economic conditions. Therefore, they often need the support of political interventions to be able to compete with established companies with traditional business models (Dalhammar et al., 2021a,b; Milios, 2021).

Research is underway to quantify environmental benefits that may arise from the sharing of unused goods through increased use intensity, transition from selling products to selling services, and potential reduction in the need to manufacture new goods and extract resources (Laukkanen and Tura, 2020). For example, Johnson and Plepys (2021) compared clothing rental with a linear business model and shows that the environmental savings potential of renting and reusing clothes depends on consumer behavior, i.e., how many times consumers wear the clothes, if they use rental to replace their purchasing or on top of it, and how consumers travel to rental stores. Martin et al. (2019) analyzed peer-to-peer sharing in a neighborhood compared to owning household items. They showed that there is significant potential for sharing services

to reduce environmental impact. Research on user experiences suggests that both positive and negative social effects can arise in the sharing economy, such as social cohesion *versus* gentrification; inclusion vs. discrimination; flexible employment *versus* exploitation (Curtis et al., 2020). It is then important to develop tools to be able to map and measure these social aspects. For the sharing economy to function in a sustainable way, new institutional forms and rules must be established to ensure environmental benefits and a positive social impact (Bradley, 2017).

Most of the research on new business models is conducted in the global north (Retamal, 2017). But there is also a need to understand the potential of new business models in the developing world and how they can be promoted and supported (Yuana et al., 2019). In the global north, research is needed on how the gap between design and implementation can be bridged to ensure that new business models result in reduced sustainability impact (Curtis, 2021). There is also a need to understand the type of governance needed, nationally and locally, to ensure socio-economic and environmental sustainability for new business models (Enochsson et al., 2021). Finally, there is also a lack of knowledge about the mechanisms for integrating and scaling up business models (Meijer et al., 2019).

### Example 3: Socio-technical systems

Infrastructure is a system, which consists of both technical and institutional components (Solér et al., 2020). Terms such as “path dependency” and “technology lock-in” are used to illustrate how social and technological systems develop over time in interaction and how previous decisions “lock” development into a certain path (Seyfang et al., 2010). Previous studies of socio-technical arrangements often focused on electricity and transport, but since then the studies have also examined other societal domains such as food, heat and buildings, water, cities and waste management (Köhler et al., 2019). Consumption-related research analyzes the material and institutional dimensions of infrastructure, which to a large extent shape consumer behavior, but over which consumers have very little control and influence (see for example Chappells et al., 2000; Hult and Bradley, 2017; Solér et al., 2020). Researchers warn that both the magnitude and extent of the negative effects from different supply systems are likely to intensify in the coming decades (Chappells et al., 2000; Van Vliet et al., 2005; Hult and Bradley, 2017). According to Cohen (2019), many modern supply systems—food supply chains, energy sources and transmission lines, urban planning and mobility services—operate suboptimally; they often exacerbate environmental impact and reinforce inequalities. This makes adjustments in the supply systems increasingly important (Solér et al., 2020).

The opportunities for individuals to avoid certain infrastructure are very limited and instead, it is political

decision-makers, urban planners and private actors who have power over the types of infrastructure that become available to people, and consequently which mobility or housing alternatives are to be “consumed.” Here, the public sector has an important role to play in promoting more sustainable supply systems and infrastructure. Public consumption and investments in infrastructure such as buildings and roads are responsible for 40% of all Swedish emissions (Naturvårdsverket, 2022). The public sector creates conditions through spatial planning and public procurement, especially procurement in sectors where the public sector has a large market share (healthcare, construction, public transport and vehicles, etc.). However, changing the market through **public procurement** is not easy, and takes time (Dalhammar and Leire, 2017). The results of a new study show that many municipalities today work actively to promote sustainable consumption in a number of different consumption areas such as energy, waste management, food, and transport (André et al., 2021), but they call for support from the national level in terms of resources and knowledge of public procurement, methods for monitoring the environmental impact of their procurement, and resources for implementing measures. The public sector has also started to work more innovatively; for example, pilot projects are currently underway for procurement for a circular economy (Göthe et al., 2021).

According to some researchers, future research in socio-technical transitions should more explicitly focus on studying supply systems and urban infrastructures, as well as challenges in transforming them (Köhler et al., 2019). There is a need for studies that explore intersections between different supply systems, such as between transport and digital infrastructure, or electricity supply and housing, and how interactions and synergies between different sectors can be used to promote change. Important questions are how existing supply systems and infrastructure are maintained, reproduced and changed and what potential they have to shape the everyday lives of city dwellers in a more sustainable direction.

### Overall shortcomings of tools for changing consumption

Just like “better consumption,” “changing consumption” falls within the framework of the existing economic system, but certain types of business models may question the prevailing “linear” flows in the economy. The shift in consumption sees change in socio-technical systems as well as social practices and business model ecologies as critical for the transition to sustainability. But there are critical perspectives (Geels et al., 2015). Critics say that an improved socio-technical system is an important step toward a sustainable society, but changes in system configuration will hardly be able to deliver sustainability gains at the required speed (Grubler et al., 2016; Kern and Rogge, 2016; Smil, 2016). Critics are also concerned that the focus of social practice theory and research in “transition

management” is primarily on understanding processes rather than contributing to changes in various societal systems to promote sustainable development. In the area of business models, a more design-oriented perspective is applied with the intention of providing insights into how business models and ecologies for business models can be transformed in a more sustainable direction (Konietzko et al., 2020; Snihur and Bocken, in press). Both circular and sharing business models have the potential to make more sustainable categories of goods and services available, such as reused, repaired and reconditioned goods (Almén et al., 2021; Dalhammar et al., 2021b), and offer new ways of consuming beyond ownership such as sharing, leasing and lending, thereby promoting consumption shifts (Enochsson et al., 2021; Johnson and Plepys, 2021). These business models can potentially lead to reduced environmental impact from consumption if and when they replace the purchase and consumption of newly manufactured goods (Johnson and Plepys, 2021). Studies of electric bicycles show that consumers tend not to replace unsustainable product alternatives, such as privately owned cars, but use both alternatives (Simsekoglu and Klöckner, 2019), which has negative environmental consequences. Theoretically, closed resource flows can reduce the need for extraction of virgin resources and new production, but at present, the contribution from closed flows to our total resource flows is very limited, partly due to rebound effects (see for example Amatuni et al., 2020; Ottelin et al., 2020).

Changing business models, understanding social practices, and even **niche-level experiments** with subsequent upscaling and proliferation, are likely to go too slowly to prevent further deterioration of the planet (Newell et al., 2021b). All of these processes are accompanied by necessary—but slow—processes of learning, interactive engagement, knowledge co-production, and networking. They need to be accelerated and scaled up, but we have a lack of understanding of how this can be done in detail. This may be because these systems, whether at the individual-practitioner level, organizational level (business models), or sectoral level (socio-technical systems), are embedded in and dependent on the established economic, infrastructural and institutional order. It may also be the case that the “agency” for major societal transformations and learning rests elsewhere. Geels et al. (2015) call for “a high level of societal urgency, access to feasible solutions, a support coalition for significant change and inspiring visions” as prerequisites for advocates of change at the socio-technical system level to accept the crucial government measures or value changes needed to have time to slow down and turn around unsustainable paths for our societal development.

## Reduce—Sufficient consumption

Advocates of strong sustainability realize the limitations of the previous two perspectives—to streamline products

and change consumers’ purchasing behavior, as well as to change supply systems and social practices. They advocate transformative conversion processes toward sustainable consumption at a macroeconomic level and with perspectives that are also “beyond the market,” and advocate a shift toward new value systems based on principles of adequacy and justice (Costanza, 2006). Proponents of strong sustainability see the need to achieve an absolute reduction in the overall levels of resource consumption and associated environmental impact (Jackson, 2009). Strong sustainability challenges the dominant way of producing, consuming and living by advocating lower consumption volumes for current generations. A small but growing stream of research models alternative ways of organizing our economy that could sustain society’s (basic) structures for slower economic growth (Viktor, 2008) or reduced consumption levels while meeting important quality of life criteria (Druckman and Jackson, 2010).

Achieving absolute reduction inevitably requires a discussion of what constitutes the good life, prosperity and human progress, and how to ensure justice within and between generations (D’Alisa et al., 2015). The notions of strong sustainability and de-growth, (see Kallis et al., 2020) are emotionally charged, as many actors associate them with images of lost wealth and freedom of choice, stagnation, reduced access to welfare and a reduced level of well being (Van den Bergh, 2011; Mont et al., 2013). At the same time, there is a stream of academic research that questions the simple links between economic growth and happiness (Easterlin, 1974, 2015; Bok, 2010; Max-Neef, 2010) even though it continues to be a topic of debate (Stevenson and Wolfers, 2008; Easterlin and Angelescu, 2009). Modeling also shows that low growth can be combined with high welfare (Victor, 2010; Jackson and Victor, 2020).

Discussions about growth and sufficiency are often intertwined as it is difficult to see how existing and future populations can be accommodated on a planet with limited resources without a certain degree of sufficiency. We still choose to draw a line between these two concepts and discuss (i) de-growth from a macroeconomic perspective based on scenario and modeling studies, and (ii) sufficiency from an individual and collective perspective that is closely linked to discussions about sustainable lifestyles.

## Example 1: Degrowth and the new economic order

In response to the growing concern linked to the role of economic growth in climate change, a growing body of researchers is working to identify potential solutions to the “growth problem” (Wiedmann et al., 2020). Wiedmann et al. (2020) divide research in the field into two groups: one reformist and one more radical. The reformist group consists of heterogeneous approaches such as de-growth (Van den Bergh, 2011), prosperity without growth (Jackson, 2009), and



“steady-state economy” (Daly, 2014). They all aim to achieve the adjustment required within the current institutions, such as market economies and centralized democracies (Alexander and Rutherford, 2014). This means that—in order to become independent of GDP growth—reforms are required by many social systems and institutions such as labor markets, the welfare state, healthcare, and pensions. Grassroots organizations have an important role to play in the transition because they must promote value and cultural changes that lead to sufficiency (Alexander, 2015). However, in order to achieve the necessary diversion of consumption and production, significant policy changes are also proposed such as “progressive environmental taxes or cap and trade systems, targeted investment in green industries and public institutions, wealth redistribution through taxation and maximum income,” a guaranteed basic income and/or reduced working hours’ (Wiedmann et al., 2020, p. 5).

When it comes to sustainability, Hickel and Kallis (2020) believe that the lower the growth, the greater the chance that it is green, as the chance of decoupling is higher if the growth rate in the economy is lower. There are two types of decoupling: relative and absolute decoupling. Relative decoupling means that resource use and GHG emissions increase, but that they increase at a slower rate than GDP growth. Absolute decoupling means that GDP growth increases without the use of resources and GHG emissions increasing. UNEP has been clear that absolute decoupling is a must (UNEP, 2011, p. 15), but evidence is growing that absolute decoupling does not take place from a consumption-based perspective (Parrique et al., 2019; Haberl et al., 2020; Wiedmann et al., 2020). Many researchers conclude that absolute decoupling appears unrealistic if one looks at developments so far. They therefore advocate that decoupling strategies be complemented by “sufficiency” strategies and absolute targets for resource extraction (Haberl et al., 2020; Wiedenhofer et al., 2020). A study that analyzed technical measures and behavioral strategies to reduce emissions from aviation, cars, public transport, food, heating and investments in buildings, and transport infrastructure, which together account for 63% of total consumption-based emissions, came to the same conclusion (Larsson et al., 2021). Only scenarios where technology development is combined with behavioral changes are in line with the goals in the Paris Agreement (Larsson et al., 2021). Another study by Millward-Hopkins et al. (2020) found that global energy consumption in 2,050 could be reduced to 1960s levels even if the population were to triple. This would require a massive expansion of advanced technology in all sectors and a radical reduction in consumption to adequate levels regardless of income.

Discourses about de-growth and sufficiency are lacking in current environmental policy, but are considered absolutely necessary by many prominent researchers given how urgent it is to implement the transformative transition to 2030–2050 (Wiedmann et al., 2020). But we can note that the reduction of consumption is now beginning to be discussed in official

documents and reports, among others in the Nordic countries (Frâne et al., 2021), even though it is still considered a radical proposal. Research is needed to specify what measures are needed to address overconsumption and endless economic growth (Creutzig et al., 2018).

## Example 2: Sufficiency and sustainable lifestyles

Sufficient consumption means a reduction in the absolute levels of resource consumption that leads to a reduction in our impact on the planet. Human needs can be met with the help of less material-intensive goods and services and with fewer goods than what we consume today (Spangenberg and Lorek, 2019). In order to maintain prosperity, a restructuring must take place not only of consumption patterns in individuals and households, but also in the restructuring of societies, i.e., technical systems, infrastructure and institutions, as well as norms. Sufficiency cannot become a new norm in a society built on the principles of consumerism and materialism. Since income is the most important reason for high consumption levels, reduced working hours can potentially lead to lower income levels and result in reduced sustainability impact (Persson et al., 2022). Changes in norms can facilitate the transition to more frugal lifestyles if it becomes more accepted to be satisfied with less material goods than is normally considered today, as well as with goods that are second-hand or repaired (Spangenberg and Lorek, 2019). Standards for using intangible social and collective goods can also facilitate the reconstruction of the good life with much less impact on sustainability.

An important branch of sufficiency research is about how different civil society movements can help promote sufficiency (Persson and Klintman, 2021). Furthermore, sufficient consumption promotes a shift to new values such as adequacy and societal orientation, economy and local grassroots innovation. There is a growing group of people who make different choices beyond consumerism (Alexander, 2013). There are examples of movements linked to simplifying lifestyles or living environmentally conscious lives, such as voluntary simplicity or ecovillages, and collective housing. Other movements and organizations promote ideas about circular economy, collaborative consumption and sharing of resources and establish repair cafes, Library of Things, Leisure Banks and the like. There is renewed interest in self-sufficiency leading to various Community initiatives for energy generation and urban cultivation. New groups and directions emerge as “slow travel movement.” Already, some consumers are joining the “DIY movement” to learn and access the necessary equipment to repair and reuse products, from upgrading electrical and electronic equipment to renovating houses to repairing and restoring cars. The transition to doing and fixing things is supported by open platforms and blogs to share knowledge and skills, open innovations and “creative places” online, e.g., Instructibles or Fixperts. More consumers are participating

in various do-it-yourself practices in “repair cafes” or “maker spaces” together with other enthusiasts where they can learn new skills or teach others (Moalem and Mosgaard, 2021). Other individuals begin to actively engage in co-production of resources (Ritzer et al., 2012). For example, they become co-producers of electricity *via* smart grids or growing food in city gardens and can consume them themselves, sell them, or share them with others.

To date, sufficiency targets, defined in terms of reducing consumption levels, have not been set at a strategic or political level. At best, sufficiency is seen as a way of life for a very small group of people under the banner of voluntary simplicity. On the other hand, research on concrete policies for sufficiency is increasing, such as environmental ceilings (Alcott, 2018), reduced working hours (Larsson, 2012), maximum income, and green taxation focused on luxury goods (Mastini and Rijnhout, 2018). Callmer and Bradley (2021) analyze different types of sufficiency, and what can be done at the local level. They advocate, among other things, local carbon budgets as a restriction on consumption, as well as strengthening social relations that are outside the market.

### Example 3: Societal transformation and sustainability

Transformation involves a “change in form” and is commonly used to address a broader societal change (Hölscher et al., 2018). An important issue in transformation research is the issue of scalability and speed, i.e., where to intervene in the system, and through what leverage point, to bring about the changes in behavior and systems needed to meet the challenges we face. These issues were discussed by the International and Interdisciplinary Cambridge Sustainability Commission on Scaling Behavior Change (Newell et al., 2021a). The Commission proposed that the complexity of change required necessitates a range of societal, infrastructural and regulatory interventions, both from the top down and at the system level, which must be matched by a “large amount of action by individuals and households” (Akenji et al., 2021). Newell et al. (2021a) suggest a distinction between “superficial” and “deep” upscaling. Superficial scaling is about integrating better practices and systems without disrupting key functions of existing systems and without questioning underlying values or worldviews. Superficial upscaling also includes downscaling that can take place at different levels; for example, by reducing the amount of waste thrown away by a household, or by limiting availability of less durable products in stores or by adjusting supply systems to make them more efficient and thus reduce resource consumption. But basic social values and norms remain undisputed. Superficial scaling is clearly linked to the notion of weak durability. Deep upscaling, on the other hand, is more associated with the idea of a paradigm shift.

### Overall shortcomings of tools for reducing consumption

Unlike “better consumption” and “changing consumption,” “sufficient consumption” questions the current growth paradigm. This is causing great concern among leading political elites. It also opens up for criticism about the extent of changes that need to take place within the next eight years. Many critics believe that de-growth can never become a reality because no political party can base its party program and message on ideas about de-growth. Geels et al. (2015) have also criticized the concept of de-growth for being too static. They call for research on dynamic processes that can facilitate the transition to sustainable systems. Other critical voices question the nature of developed democracies as potentially unsuitable for dealing with major crises such as the climate crisis (Abadi, 2022).

Processes aimed at societal transformation are considered to be slow. They are often based on social criticism of existing institutions and structures. Boström (2020) suggests that social criticism must also look inwards, i.e., there must be a self-critical, transformative learning process. Transformative learning opens up opportunities to re-evaluate our frames of reference as well as the assumptions and worldviews that we take for granted. When it comes to (over) consumption, today’s consumption is so natural for us that many of our decisions become automatic (Jackson, 2005) and then it becomes difficult to make them more aware and then change them. Furthermore, the discourse on adequacy is based on assumptions about active prosumers. However, there are concerns about the extent and level of competence and skills required to actively participate in prosumerism and support the repair community and similar movements (Irwin, 2015). Transition towns and repair communities are examples of how new skills can be created in a participatory, collective, and empowering way. Adaptation design can be of interest here as it is based on the idea that not only knowledge, skills and actions should be developed, but also the stories of adaptation processes (Barr and Pollard, 2017).

### Conclusions and future research

Sustainable consumption is a growing research field, with many different perspectives. Much of this research points to the need for policy-makers’ leadership to achieve the goals of the Paris Agreement. In particular, policy-makers need to take the lead in guiding the transition to a sustainable future and work to engage various actors and societal stakeholders in the transition to an economy and a society that allows for sustainable consumption to become mainstream. Importantly, efficiency-oriented solutions are not going to be enough to succeed in the transition, requiring active engagement with sufficiency-oriented solutions. We therefore need more research that evaluates the economic, environmental and social consequences

of sufficiency measures, taking into account the potential of voluntary movements such as prosumerism, sharing economy, and voluntary simplicity. So far there is limited research investigating different scenarios for a future society with reduced consumption (e.g., Svenfelt et al., 2019; Larsson et al., 2021). Much more of this type of research will be necessary for policy-makers to make confident decisions in implementing sufficiency-oriented measures. This includes an understanding for how sufficiency can be implemented in different groups within the population, and how a successful policy-mix can look like.

As sufficiency can easily be experienced as a reduction in living standards, it is of crucial importance to understand how different groups in society will react to policy-interventions to support sufficiency-oriented measures, as well as how to increase acceptance for such measures. Importantly, the perceived burden of such measures should be perceived as fairly distributed across society. Governance toward a sustainable future is intimately linked to issues of morality, values and ethics, power, justice and equality. There is therefore a need for research that makes a more comprehensive analysis of winners and losers in a transition to sustainable consumption, as well as what arguments can help convince different groups that the transition is necessary and can benefit their group in the short and long term. Related to this, there is a need for research that identifies the benefits of the necessary adjustment, and how different groups can see this in a more positive light. This encompasses even questions about the importance of growth for our economy and the potential for de-growth. Research funders should be prepared to support even controversial research on these issues, as there is a need for financial support for researchers studying alternatives to our current economic system, potential ways forward, and acceptance of different developmental pathways in people from different social groups. Considering that change appears to be inevitable, very little research is conducted on this. Research must also study how more comprehensive and equitable processes for societal transformation toward sustainability can be initiated, including ecosystems of transformation, as well as mechanisms for scaling up new sustainable practices, business models, supply systems and infrastructure that can be accommodated within planetary boundaries.

Regarding efficiency-oriented policies, it is of crucial importance that research into rebound-effects continues and

intensified to answer the all-important question what impact various efficiency-gains have on sustainability goals. In refining our understanding of rebound effects, the focus needs to shift from the implementation of individual policies to the implementation of combinations of actions, in order to increase efficiency by increasing synergies and reducing potential contradictions between policies and unforeseen consequences.

All in all, an important role is handed to policy-makers as they are required to lead efforts to achieve sustainable consumption. It is now important that policy-makers understand their imminent responsibility and act with the necessary urgency.

## Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

## Author contributions

ML, CD, and OM: conceptualization and writing. CD and OM: methodology and investigation. CD: project administration and funding acquisition. All authors contributed to the article and approved the submitted version.

## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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