

Impacts of Consumption and the Role of Business

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Abstract

Dominant unsustainable consumption patterns in developed countries have led to increasing climate and biodiversity issues. Through consumption-based accounting, at least 70% of the environmental footprint (carbon emissions, blue water extraction, resource use, and land use) can be attributed to food, housing, the use of appliances, and transport. Total consumption of dominant consumer goods such as clothing and electronics is only on the rise, also leading to increasing levels of waste. Given these adverse trends, and the key role of business in society, this chapter focuses on a potential positive role by business and

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investigates the following question: Can business have a positive role in supporting or even driving sustainable consumption, and if so, how? First, a Business for Sufficiency framework is introduced – based on the top strategies in the waste hierarchy and the four “lessens” – to map possible business-driven strategies. Second, this framework is applied to the sectors of food, housing, appliances, and transport. Based on this analysis, it was found that business indeed has a plethora of options, including green alternatives, service-driven business models, platforms, and strategies to moderate consumption. However, green alternatives were most prevalent. While some businesses also operate in the refuse (do not overconsume) option, it is likely that new policies are needed to drive sustainable consumption. The EU Circular Economy Package is an important lever for policy change, but a specific focus on sufficiency may help guide even more stringent policies to curb unsustainable consumption patterns that are detrimental to the environment and ultimately society itself.

Keywords

Consumption · Sustainable consumption · Sufficiency · Business for sufficiency · Food · Mobility · Clothing

1 Introduction

More consumption? Is that even possible within our planetary boundaries? By 2050, the world is expected to consume “as if we were three” planets (European Union 2020, p. 4). While in developing and emerging countries, there is a clear need to ensure that everyone has access to fundamental needs such as food, sanitation, access to care and education, overall, we are consuming more planetary resources than we can sustain in the long-run (O’Neill et al. 2018). Four of the key planetary boundaries have already been surpassed: climate change, biosphere integrity, land-system change, and biogeochemical flows (O’Neill et al. 2018). Our consumption of natural resources is on a dangerous and unsustainable track: The global use of natural resources has more than tripled since 1970 and continues to grow, while natural resource extraction and processing is responsible for more than 90% of biodiversity losses and water stress (IRP 2019).

Businesses can and should be a core driver for change as it is estimated that business alone determines 80% of the world economy (Smit 2019), driving the demand for goods and services. Current institutionalized, unsustainable business models drive consumers to overconsume and buy products they do not need or even want (Jackson 2009) in consumer goods sectors like clothing, food, and electronics (Bocken and Short 2021). For example, clothing production has doubled in less than 20 years, and people on average bought 60% more garments in 2014 compared to 2000, with about 85% of textiles going to waste each year (McFall-Johnsen 2021). For food, about a third of still perfectly edible food is going to waste, releasing

methane, and contributing to climate change (FAO 2011), which is due to all kinds of problems in the supply chain such as storage and processing losses, inappropriate packaging, damage during transport, but also over-selling and buying (e.g., 2-for-1 buys; bulk buys, large portion sizes) (Papargyropoulou et al. 2014). As for electronics, cell phones have become the largest electronic market in the last two decades with around 1.4 billion new phones sold every year (Circular 2020). They are often replaced before their technical lifetime, with the average lifespan of a smartphone declining to only a year (Haucke 2018). Worse, behind many of these consumer products, there are often (human and natural) resource-exploitative business models and complex value chains with extensive logistics channels, exacerbated by a focus on quantity rather than quality (Bocken and Short 2021). Overall, per capita consumption of natural resources, such as wood and water, has been increasing much faster than the population, with environmental consequences, such as climate change and biodiversity losses (Dauvergne 2008, in Pereira Heath and Chatzidakis 2012).

Given these adverse trends, this chapter focuses on understanding the environmental impacts of consumption patterns and discusses a potential positive role for business. Can business have a positive role in supporting or even driving sustainable consumption, and if so, how? We first explain and detail the impacts of consumption based on earlier studies. This is followed by potential “business responses for sufficiency” based on a framework embedded in different literature streams. Finally, we describe future pathways for research and practice.

2 Impacts of Consumption

The environmental impacts of our global economic system can be measured via a number of perspectives (Gallego and Lenzen 2005; Lenzen and Murray 2010; Tukker et al. 2020). The most typical one is production-based accounting: emissions and resource extraction by a specific sector or within a country. Consumption-based accounting is another widely used approach: This approach measures all the emissions and primary resource requirements needed to satisfy a specific consumption basket (e.g., of individuals or countries; Davis and Caldeira 2010). Other, less used accounting approaches are income-based accounting (impacts created by the downstream use of products a sector or country produces; Marques et al. 2012; Liang et al. 2017) and value-added based accounting (emissions and resource uses along value chains are allocated to each step in the chain based on value added; Pinero et al. 2018). These perspectives reflect how responsibilities can be allocated for the environmental impacts created by our global production system, that is, in the form of polluter pays (production-based accounting), user pays (consumption-based accounting), producer responsibility (income-based accounting), or beneficiary pays (value-added based accounting). While consumption-based accounting is widely seen as the most appropriate way to allocate environmental impacts to activities of final consumers, some nuances have been suggested, too (e.g., Kander

et al. 2015). For instance, if a country produces products for exports with a highly inefficient and carbon-intensive production system, this seems to be more something to be solved by that country rather than by the consumers.

Altogether, consumption-based accounting gives good insight into how final consumption expenditures drive environmental impacts. It can be used to explore to what extent environmental impact might be lowered given changes to what is purchased and consumed (Kanyama and Benders 2021). Global Multi-regional Input Output Tables (GMRIO) have become the method of choice for calculating such consumption-based accounts (although also very suitable to calculate responsibilities via the other perspectives; Tukker et al. 2016, 2020).

Around 2006, some of the first major consumption-based accounting studies were conducted, summarized, and completed with new work in the EIPRO (Environmental Impacts of Products) study commissioned by the EU (Tukker and Jansen 2006). Mainly using GMRIO, such studies concluded that *food, housing, and the use of appliances* and *transport* drive some 70% of the impacts of final consumption, regardless of whether this concerns carbon emissions, blue water extraction, resource use, or land use (Tukker et al. 2010). This finding has consistently been confirmed by later studies including a 2010 review of the International Resources Panel (e.g., Hertwich et al. 2010; Ivanova et al. 2016, 2017; Wood et al. 2018). Within the home, the impacts are mainly driven by how consumers heat and cool their homes. The use of energy using appliances such as fridges, lighting, TV sets, and computers is crucial, too. Around 50% of the impacts of food consumption are driven by meat and dairy, followed by other food products (Tukker and Jansen 2006; Tukker et al. 2010). For mobility, car transport is dominant, followed by air transport and public transport. Carbon emissions are driven by all these final consumption areas, where housing dominates resource use, and food consumption particularly drives water and land use.

Determinants of the height of impacts include the following (Tukker et al. 2010). First, higher income leads to higher expenditure and hence higher impacts, but since usually, the surplus is spent on quality rather than quantity, the impacts per monetary value drop (Scherer et al. 2019). Second, household size is relevant, since larger households tend to have lower impacts per person benefitting from some “economies of scale” (e.g., shared use of heated space, TV, etc.). Moreover, urbanites tend to have lower impacts (because of smaller houses, less exposed surface, and more use of public transport) compared to rural dwellers, although urbanites may make more use of flights. Third, car ownership and food habits (e.g., being a vegetarian or not) are relevant, too. Fourth, individual choices on how to spend one’s spare time matter. Low carbon local activities, such as socializing with friends and sports, may contribute to greater levels of well-being as well as a lower environmental footprint (Druckman and Gatersleben 2019). It should be noted that next to traditional production-based reduction options (e.g., greening the electricity and transport systems), such factors help to identify the potential for consumption-based interventions that help to allocate income expenditure to more sustainable options.

3 The Role of Business in Driving Sustainable Consumption

This chapter specifically focuses on the role business may have in driving sustainable consumption as business motivates the demand for typical consumer goods and services. While business is often depicted as the culprit driving unsustainable consumption patterns, recently, authors have investigated the potential of business driving sustainable consumption or “sufficiency” (Bocken and Short 2016; Cohen 2021; Freudenreich and Schaltegger 2020; Frick et al. 2021; Tunn et al. 2019). Businesses driving sufficiency can mean that they encourage their consumers to make do with less (Bocken and Short 2016) or to consume within the planetary boundaries to ensure that there will be “enough, for everyone, forever” (Alexander 2012).

While there is a plethora of articles and books on sustainable consumption, the literature stream of business driving sustainable consumption is much narrower. Broadly, Niessen and Bocken (2021a) found that “sufficiency” as a potential viable approach for business and consumers come from two dominant literature streams.

First, English-speaking conceptualizations of sufficiency strategies have analyzed business sufficiency actions through the highest tiers of the waste hierarchy (Bocken and Short 2016) or strategies of businesses to influence the customer (Bocken 2017). The frequent application of the waste hierarchy (Lansink 1979) by practitioners and researchers makes it a useful basis for a framework that also appeals to practitioners. Rethink, Reduce, and Refuse are in the top of the waste hierarchy (Lansink 1979) and are associated with a sufficiency strategy focused on doing more with less (Bocken and Short 2016).

Second, German-speaking literature applies sufficiency to business through the four “lessens,” attributed to Sachs (1993). These four lessens are the four dimensions of a sufficiency economy: less clutter, less speed, less distance, and less market (Sachs 1993, in Niessen and Bocken 2021a). *Less clutter* refers to finding simpler alternatives with only the necessary base components, and in general doing with less. *Less speed* is about slowing production and consumption through long-lived and reliable products and services (similar to “slowing the loop,” Bocken et al. 2016; Stahel 1994). *Less distance* is about keeping economic activities more local or regional with less complex value chains, the latter often being associated with unsustainable business model practices (Reinecke et al. 2019). *Less market* is about finding ways that are less commercially focused but more focused on positive impact. While this may seem like a “strange” strategy in a business context, several examples have emerged in this space such as the benefit corporation, a new form of business that balances environmental and social purpose and profit ([bcorporation.net](#)), and the sharing economy, a socioeconomic system that facilitates temporary access to under-utilized goods often for no or a small fee (Curtis and Mont 2020; Henry et al. 2021).

Bringing these disparate literature strands together, a framework guiding business for sufficiency was developed (Fig. 1). Building on the concepts of Rethinking (consuming differently), Reducing (consuming less), and Refusing (not over-consuming), as well as Less clutter (simplified and less), Less speed (slower and

	Rethink <i>Consume differently</i>	Reduce <i>Consume less</i>	Refuse <i>Don't (over)consume</i>
Less clutter <i>Simplified & less</i>	No ownership (N.O.) Personalised production Green alternative	N.O. + price incentive Demand reduction service	Moderating sales Question consumption
Less speed <i>Slower & more reliable</i>	Reuse Personalised production Green alternative	Life extension service Long product warranties	Question consumption
Less distance <i>Regional & disentangled</i>	Green alternative	Short distance promotion	Question consumption
Less market <i>Beyond commerce</i>	Open-Source creation Exchange platforms	Support for repair & reuse Exchange platforms	Support for self-sufficiency
	Design	Awareness-raising	

Fig. 1 Business for Sufficiency Framework. (Source: Niessen and Bocken 2021b)

more reliable), Less distance (regional and disentangled), and Less market (beyond commerce), the framework includes different potential strategies based on earlier research in the field and business practice.

4 Pathways for the Future: Gaps and Future Steps

As Sect. 2 highlighted, food, housing, and the use of electrical appliances and transport dominate the consumption-based accounting environmental footprint. Bringing together the key sectors that drive environmental impact and the Business for Sufficiency Framework, this section maps key strategies that may be adopted by businesses building on best strategies seen in practice. Next, the potential business for sufficiency strategies for food, housing, appliances, and transport is described.

4.1 Food Strategies

Impacts of food consumption are dominated by animal-based products (meat, dairy, and eggs) (Tukker and Jansen 2006). In addition, much of the (perfectly edible) food is wasted in the value chain (Papargyropoulou et al. 2014). Furthermore, one can question whether the ever-more complex value chains where food is shipped over long distances are sustainable (Bocken and Short 2021). Switching to a plant-based

diet could thus be one of the most impactful ways to reduce one's footprint (Wynes and Nicholas 2017). While beneficial for reducing the environmental impact, a shift to a more plant-based diet and reduced consumption of meats and dairy is also recommended for health reasons (Willett et al. 2019). Other ways to reduce the impact of food consumption include removing wasteful practices from the food value chain and, when possible, producing more locally (Papargyropoulou et al. 2014; Sandberg 2021). Furthermore, the food industry has been criticized for its complex value chains, with poor labor standards (e.g., use of pesticides harmful for workers) and low wages compared to higher supermarket prices in Western countries (Bocken and Short 2021; Reinecke et al. 2019). Businesses driving sufficiency can help curb unsustainable consumption practices while raising awareness of the impacts of food on the environment and society. One such example is provided by Swedish food producer Oatly, who promote plant-based diets through offering oat-based dairy substitutes, but are also outspoken in their marketing and try to raise awareness (Bocken et al. 2020). Sufficiency strategies can also help support social sustainability and the work towards the Sustainable Development Goals (SDGs) by improving health and supporting the fight against hunger, for instance by ensuring less food is wasted.

Table 1 includes possible business for sufficiency options for the food sector and examples of companies who pursued this strategy.

As Table 1 shows, food sector businesses can implement sufficiency strategies from any of the dimensions, ranging from promoting the consumption of only what is needed, for example, through differentiated portion sizes or foregoing 2-for-1 discounts, over selling locally produced and seasonal foods, to supporting consumers in "prosumption" (production and consumption) and food sharing. With both plant-based diets and food waste prevention identified as large contributors to sustainable development, businesses can help guide consumers into the direction of healthier diets and less food waste while also ensuring that their own operations move towards fair value chains and sustainable production.

4.2 Housing Strategies

The impact of housing is about how homes are built, but also about their ongoing impacts, which is dominated by how consumers heat and cool their homes (Tukker and Jansen 2006). This is followed by the use of electric appliances in the home, discussed in the next section.

The first negative trend from an environmental perspective is the increasing housing size, which has tripled between 1950 and 2015 in the US, due to lifestyle expectations, spaces for special functions (e.g., playrooms, home offices) and the increasing number of bathrooms (Cohen 2021). While this has an increased level of embedded carbon through the use of materials which take energy to produce, it also increases the amount of space to heat and cool. At the same time, household sizes have been decreasing, indicating that the space used per person is only increasing (Cohen 2021). Second, energy use in the home is increasing with living standards

Table 1 Business for Sufficiency strategies for food

	Rethink (consume differently)	Reduce (consume less)	Refuse (don't overconsume)
Less clutter – simplified and less	Green alternative: Plant-based foods (Oatly) Only simple/limited number of ingredients Reusable packaging (Loop) or zero waste options	Awareness-raising: Advocate meatless Mondays (www.mondaycampaigns.org) or only eating meat once a week	Moderating sales: Sell only what is needed (e.g., no “2-for-1” deals) (Bio Company) From all you can eat to pay for food weight (IKEA trialed paying for the weight of food in stores to reduce waste) Made to demand/reduce portion size (differentiated portion sizes)
Less speed – slower and more reliable	Green alternative: Higher quality, locally sourced, seasonal (Slow Food movement) Rescued food (Oddbox)	Awareness-raising: Promote seasonal produce (Abel & Cole vegetable box)	Question consumption: e.g., of internationally shipped food; fast food Moderating sales: Remove non-seasonal (i.e., long-distance) products from store
Less distance – regional and disentangled	Green alternative: Locally produced food Fair, direct supply chains (Tony's Chocolonely; Reinecke et al. 2019)	Short distance promotion/awareness-raising: Promote regional produce (Bio Company)	Moderating sales: Remove long-distance products from store
Less market – beyond commerce	Exchange platforms: Farmer cooperatives	Exchange platforms: Food sharing/repurposing (ResQ Club; OLIO)	Support for self-sufficiency: Training for growing own food, food preservation, keeping bees, etc.

and exacerbated by rising temperatures caused by climate change. For instance, it is estimated that air-conditioning consumption of the 20 most prosperous countries has increased by around 400 TWh between 2015–2018, as temperatures have been on average 6% higher than normal (Enerdata 2019). This additional energy consumption is equivalent to the yearly energy consumption of buildings across the African continent (Enerdata 2019).

Options for housing should focus on the construction of the home itself and how energy is consumed. With regard to construction, one option is to promote radical changes to home sizes (Cohen 2021; Sandberg 2018). Such reduced-sized dwellings include tiny houses, which have gained popularity in recent years, but also small city apartments such as the StudioKoti in Finland (Sandberg 2018). Shared living space also promotes sufficiency in housing and is on offer not only for living space but also

for office space, such as in co-working spaces (Cohen 2021). Another important strategy can be found in the use and redesign of existing infrastructure which would lower the need for new material and resource inputs (Sandberg 2018). To lower the impact of domestic energy consumption, Sandberg (2021) suggests to shift housing types away from detached to semi-detached or terraced houses and apartments. Next to such radical changes, other options include buying green energy to reduce the footprint at home, as well as replacing energy-using products such as light bulbs with less energy-consuming alternatives such as LEDs (Wynes and Nicholas 2017).

Table 2 provides a summary of business for sufficiency strategies for housing.

As visible in Table 2, the housing and construction sector can support sufficiency through a variety of strategies. In the Rethink dimension, using existing housing stock, promoting shared living and working arrangements, and sustainable material choices are some of the potential strategies. More radical suggestions include advocating for smaller living space, for instance through promoting small apartments or Tiny Houses. While a smaller living space has a positive environmental impact through reducing the resources needed for heating and construction, it is a socially contentious issue as more living space is often considered to be directly linked to higher well-being. Therefore, while the voluntary simplicity movement is growing and Tiny Houses are gaining popularity, any large-scale adoption of smaller living spaces would have to be combined with policies that allow for adequate housing for all, including the provision of public spaces, and should be developed together with affected citizens.

4.3 Electrical Appliances Strategies

Related to the impact of housing is the use of energy using appliances such as fridges, lighting, TV sets, and computers, summarized here as “electrical appliances.” Electrical appliances such as laptop computers and mobile phones are replaced at an ever-increasing rate with the average lifespan of a smartphone declining to only a year (Haucke 2018). At the same time, 80% of electronic waste sent for recycling is in fact shipped and dumped, often in developing countries (Ryder and Houlin 2019). While the increasing volume of this sector is a problem, the projected electricity demand from information and communications technology is also forecasted to be 21% of the total global demand by 2030, worsening the overall impact of the industry (Jones 2018). The most effective strategies would be to buy less, followed by reducing the use of the devices or making sure they are charged with renewable energy, and finally, recycling effectively (Wynes and Nicholas 2017).

The design of appliances can also play a key role in their impact, with companies such as Fairphone offering modular appliances with replaceable parts which enable a long product life (Haucke 2018). Businesses can promote more sustainable consumption through promoting the sharing of appliances which can entail that items are used more intensely and resource use is reduced as fewer products are needed (Sandberg 2021). Additionally, businesses can link the pricing to the resource use of

Table 2 Business for Sufficiency strategies for housing

	Rethink (consume differently)	Reduce (consume less)	Refuse (don't overconsume)
Less clutter – simplified and less	Green alternative: Materials (green roofs, RE-powered homes, passive energy homes) Appliances (efficient products) Shift in housing type to semi-detached, terraced and apartments (Sandberg 2021)	Awareness-raising: Promote smaller living (StudioKoti)	Green alternative: Tiny house movement Smaller houses and micro-apartments (StudioKoti) (Cohen 2021)
	No ownership: Offer co-living/-working options (WeWork)	Demand reduction services: Consultancy for lower energy/water use (CO2Online) Retrofit houses to avoid demand for heating/cooling (Creutzig et al. 2018)	
Less speed – slower and more reliable	Reuse: Encourage use of existing buildings (Lacaton & Vassal architects)	Life extension service: Renovate existing buildings (Lacaton & Vassal)	Green alternative: Redesign existing buildings into smaller units
	Green alternative: Modular, upgradable (Kodasema) Highly durable material		
Less distance – regional and disentangled	Green alternative: Locally sourced or produced components	Short distance promotion: Promote locally produced materials	Awareness-raising: Local communities in cities focused on keeping consumption local (Prendeville et al. 2018)
Less market – beyond commerce	Exchange platforms: Material Exchange platforms (restado.de)	Support for repair and reuse: Training for repair and renovation	Support for self-sufficiency: Training for building (e.g., hempcrete structures)

their appliances, such as HOMIE washing machine rental where users pay per wash and the price increases with higher laundry temperatures (Bocken et al. 2018).

Table 3 includes some of the key sufficiency strategies for electrical appliances.

In terms of businesses in the electrical appliances sector, sufficiency strategies largely work towards either longer lifetimes and more intense use of the items or support a reduction of use time, for instance through advocating more in-person

Table 3 Business for Sufficiency strategies for electrical appliances

	Rethink (consume differently)	Reduce (consume less)	Refuse (don't overconsume)
Less clutter – simplified and less	No ownership: Appliance rental or leasing (Gerrard Street) Paid sharing platforms (Peerby)	No ownership + price incentive: No ownership but pay per use (HOMIE)	Moderate sales: Sell fewer devices in total, e.g., through multifunctionality
			Question consumption: Promote “appliance free” time
Less speed – slower and more reliable	Reuse: Resale, refurbished products (LEAPP)	Life extension service: Repair services (iDoc)	Awareness-raising: Support customer to replace appliances less often (automatic updates and repairs)
	Personalised production: Modular, adaptable products (AIAIAI)	Long product warranties: 4-year warranty (Teracube)	
	Green alternative: Modular, durable, fair (SHIFT Phone)		
Less distance – regional and disentangled	Green alternative: Locally sourced materials Transparent supply chains (Fairphone)	Awareness-raising: Promote less appliance use time and instead local experiences	Question consumption: Replace digital use with local face-to-face experiences
Less market – beyond commerce	Open-source creation: Open source code (Fairphone)	Support for repair and reuse: Provide spare parts (Fairphone) Repair manuals (iDoc)	Awareness-raising: Promote less use and collaborative use
	Exchange platforms: C2C resale platforms (Ebay) Sharing platforms (Library of Things)	Exchange platforms: Repair knowledge share (Fairphone community)	

experiences. While a reduced use of items is environmentally beneficial (Wynes and Nicholas 2017), the most sufficient option would be to buy less. Buying fewer new items can be promoted through long product lifetimes, with durable or modular designs, such as with the Fairphone or AIAIAI headphones, through long product warranties or through repair support. More intense use can be promoted through rental or subscription services, such as Gerrard Street headphones, or through item reuse. As these appliances use energy, a pay-per-use service could integrate differentiated pricing to encourage reduced energy use.

4.4 Transport Strategies

For personal transportation, air transport has the highest impact in grams of greenhouse gas emissions per kilometer travelled, followed by car transport and public transport (European Environmental Agency 2021). Going car-free and avoiding transatlantic flights, as well as switching to electric cars, or replacing them with hybrid models reduces the impact of consumption the most (Wynes and Nicholas 2017). Nevertheless, the best option of course is to opt for low-carbon activities such as walking and cycling where possible, but some form of longer distance transportation will likely continue to be part of personal transport.

In transport research, the Avoid-Shift-Improve model has been used to build a more sustainable transport system (Creutzig et al. 2018). Unnecessary transport should be avoided through remote working or compact city planning, mobility should shift from fossil fuel-driven vehicles to cycling, walking, or public transport, and vehicles should be electrified and more light-weight (Creutzig et al. 2018). Sandberg (2021) additionally points to the potential of car- or bike-sharing to reduce private vehicle use and thereby consumption.

Table 4 includes some of the key sufficiency strategies for transportation.

Sufficiency in mobility is first and foremost promoted through reducing the distances that consumers have to travel, for instance by providing attractive alternatives at a shorter distance and promoting local or regional travel. Businesses can also support the modal shift away from private car use to cycling, walking, and public transport, for instance through offering mobility hub connections, as in the case of DB Connect or OV-fiets. Linked to this, such mobility offers can promote shared mobility by offering mobility rental or leasing. Finally, existing vehicles can be kept in use longer, through repair, durable design, and reuse.

5 Summary

Consumption-based accounting provides relevant insights into how final consumption expenditures drive environmental impacts. This is important because nowadays, many goods are imported from abroad, and this impact is included in a consumption-

Table 4 Business for Sufficiency strategies for transport

	Rethink (consume differently)	Reduce (consume less)	Refuse (don't overconsume)
Less clutter – simplified and less	No ownership: Rental or subscription (Swapfiets)	No ownership + price incentive: Rental with pay per distance or time driven (GoCar) Rental with price difference between modes (Hely Hubs)	Question consumption: Promote short-distance mobility over long-distance
	Green alternative: Shift to bikes, public transport (DB Connect) Electric cars (Polestar)		
Less speed – slower and more reliable	Reuse: Vehicle resale	Life extension service: Repair service (Swapfiets)	Question consumption: Question need to travel fast (KLM Fly Responsibly)
	Green alternative: Rail travel rather than air travel (slow travel) Durable products (VanMoof)	Long product warranties: Lifetime warranty (Giant bikeframes)	
Less distance – regional and disentangled	Green alternative: Offer public transportation hubs	Short distance promotion: Promote short distance options (ReNatour) Support working from home (e.g., Zoom; MS Teams)	Question consumption: Question need to travel far (KLM Fly Responsibly)
Less market – beyond commerce	Exchange platform: C2C sharing (Hiyacar) Carpooling (Blablacar)	Support for repair & reuse: Repair manual Repair training	Support for self-sufficiency: Lower need to travel, for e.g., shopping

based accounting measure. Based on consumption-based accounting using GMRIO, food, housing, appliances, and transport were found to be major drivers of a person's environmental footprint. Since business drives this demand for ever-increasing consumption and its associated environmental impacts, this chapter investigated the following: Can business have a positive role in supporting or even driving sustainable consumption, and if so, how?

The Business for Sufficiency framework (Niessen and Bocken 2021a) was explained and applied to understand possible strategies to drive sustainable consumption in a business context. Based on applying the framework to the dominant sectors that drive consumption-based environmental impact – food, housing, appliances, and transport – several viable business strategies for sufficiency were

identified, ranging from green alternatives, service-driven business models, and platforms, to strategies focused on moderating consumption. Many options also can also be linked to local low-carbon activities, often linked to greater levels of well-being (Druckman and Gatersleben 2019).

Policy and urban planning also have an important role to play. Many viable options appear to be green alternatives; for a more radical change, policies may need to be implemented at the intersection of consumer rights and producer and, more broadly, business, responsibilities. While the EU Circular Economy Package (European Union 2020) is seeking to empower consumer to help increase the lifetime of products with a focus on “right to repair,” availability of spare parts, warranties, and avoiding planned obsolescence, the focus on sufficiency (i.e., a sufficiency-based circular economy; Bocken and Short 2020) may help guide even more stringent policies to curb unsustainable consumption patterns that are detrimental to the environment and ultimately society itself. Furthermore, there is a potential key role for urban planners (Prendeville et al. 2018). Urbanites tend to have lower impacts (e.g., smaller houses, more use of public transport) than rural dwellers, and dense cities with good public transportation options tend to have a lower impact than areas of urban sprawl, which comes down to the need for sustainable urban planning.

Finally, the role of the individual and personal choice is extremely important and impactful with regard to consumption. Car ownership, food habits (e.g., being a vegetarian or not), energy choices (e.g., green energy): personal choices on how you live, consume, move around, what you eat, and buy drive environmental impact (Wynes and Nicholas 2017). While there seems to be greater attention for and knowledge about environmental issues, the increasing impacts of climate change and biodiversity losses make action by all actors ever more urgent. Future research may focus on viable (business for) sufficiency options that target different levels of income (Scherer et al. 2019), household type, as well as gender (Kanyama and Benders 2021), as different environmental impact patterns have been identified for these types. And, as outlined above, individual changes towards sustainable consumption can be supported not only by peers, governments, or non-governmental organizations but also by businesses who want to lead the way towards a sustainable economy.

6 Cross-References

- [Business Ethics](#)
- [Defining Sustainability](#)
- [Introduction to Economics and Sustainability](#)
- [Sustainable Business Management](#)
- [The Circular Economy and Planned Sustainability](#)

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