

# Sustainable Consumption<sup>1</sup>

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## Abstract

*This chapter elaborates on sustainable consumption and provides key arguments from the sustainable consumption literature. It introduces ‘environmental space’ as one of the early concepts which embedded sustainable consumption within natural and social boundaries. It explains why a floor as well as a ceiling for the environmental space has to be considered and reflects on the space itself, its size and how to share it. Various possible paths of transition to reach the environmental space from a position of overconsumption as well as from underconsumption are described and linked to various schools of thought in sustainability research. Specific emphasis is given to a more detailed analysis of the two concepts of ‘green growth’ and ‘de-growth’. Relating these concepts to sustainable consumption research and politics, the chapter distinguishes between strong and weak sustainable consumption and outlines some enabling mechanisms for sustainable consumption.*

**Keywords:** Sustainable consumption, environmental space, green growth, de-growth, enabling mechanisms, strong sustainable consumption.

## 1 Introduction

Consumption is a vital element within the economic system. The economy in turn is a social construction through which society structures the exchange of goods and services. It is embedded in the natural system of planet Earth. As the rich literature on bioeconomics or ecological economics explains (Daly 1996; Martínez-Alier/Healy/Temper et al. 2013), the way the economy is structured has led to fundamental problems because it overstretches the limits of the Earth’s carrying capacity, insofar as human activities inevitably alter the face of the system Earth (Steffen/Crutzen/McNeill 2007).

There are valid reasons to make consumption sustainable. The *UN Conference on Environment and Development* (UNCED) in its ‘Agenda 21’ identified for the first time unsustainable consumption and production patterns, *particularly in industrialized countries*,<sup>3</sup> as the major cause of the continued deterioration of the global environment (United Nations 1992). The resulting call for sustainable consumption and production is based on the ideas that, firstly, planetary boundaries set the limits in the long run (Costanza 1989; Georgescu-Roegen 1966), and, secondly, that societies work better if they are based on democracy and score highly on equality (Pickett/Wilkinson 2009). It can be expected that such sustainable consumption requires more than just changing a few unsustainable habits and products here

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<sup>3</sup> At present, more than half of the ‘consumer society’ is based in (former) developing countries. Nevertheless, leadership towards more sustainable consumption patterns is still required from developed countries. Hence, examples in this article are taken mainly from a Northern, and especially European, context.

and there. It requires changes in the economy, the infrastructures serving our daily lives, and the dominant culture, as well as the institutions and power relationships which drive these (Vergragt/Akenji/Dewick 2014).

Such a broad approach was—and still is—not always reflected in the use of the term ‘sustainable consumption’—neither in the academic or political literature, nor in classroom discussions on sustainability, nor in concerned statements by environmentally engaged neighbourhoods. For quite some time, mainly in the late 1990s, ‘sustainable consumption’ was limited to the decision-making of private consumers, following the UNCED idea that consumers are not only the victims but also the cause of environmental problems. As a result, sustainable consumption was reflected in the concepts of sustainable household consumption or sustainable consumption behaviour (Georg 1999; Haake/Jolivet 2001; Noorman/Uiterkamp 1998; Zacarias-Farah/Geyer-Allély 2003). At that time, emphasis was placed on case studies and single-product advice about what consumers could do to contribute to sustainability. The picture has developed since then, as least in scientific writing and debate. It is now increasingly recognized that such product- and/or service-oriented approaches might lead to some less unsustainable consumption here and there (Brunner/Urenje 2012), but they are hardly a contribution towards consumption pattern that can be called sustainable.

To distinguish sustainable consumption explicitly from such fragmented considerations, this chapter takes sustainable *resource* consumption as a starting point and takes the complete life cycle of products as well as lifestyles into account. In this context, sustainable consumption stands for

- (1) limiting the consumption of depletable resources via
  - a. more efficient use,
  - b. as well as their substitution by renewable resources,
  - c. as well as reducing consumption levels in general, and
- (2) limiting the use of renewable resources to their reproduction rate.

Sustainable (resource) consumption thus involves the consumption patterns of industries, governments, households and individuals (United Nations 1992). In addition to this approach in physical terms, strong sustainable consumption also takes into account the social aspects of, for example, labour rights (ILO 2001), sustainable livelihoods (Lebel/Lorek 2008), and unequal access to and distribution of resources, as reflected in the literature on environmental rights and environmental justice (Martínez-Alier/Healy/Temper et al. 2013; Martínez Alier 1997).

To date, the physical, material flow aspects dominate research on sustainable consumption. In the late 1990s, researchers began to ask which kinds of consumption cause the most environmental impact. They found that the greatest environmental impact per capita is caused by food, housing and mobility (Gatersleben/Steg/Vlek 2002; Lorek/Spangenberg 2001; Noorman/Uiterkamp 1998; Tukker/Jansen 2006). More recent data are provided, for example, by the *European Environmental Agency* (EEA 2013). They point out that only a few product groups contribute significantly (between 30 and 50 per cent) to environmental pressures:

- construction works, that is, buildings and infrastructures;
- food products, beverages and alcohol;
- products of agriculture, forestry and fishing (also food products bought directly from farms rather than via food manufacturers);
- electricity, gas, steam and hot water (the majority of which is contributed by electricity).

These four product groups contribute 42 per cent to greenhouse gas emissions, 52 per cent to acidifying emissions, 37 per cent to ground ozone precursors, and 55 per cent to the *Total Material Requirements* (TMR) embodied in all consumed products in 2005. Interestingly, they only represent 17 per cent of total consumption expenditure (EEA 2013).

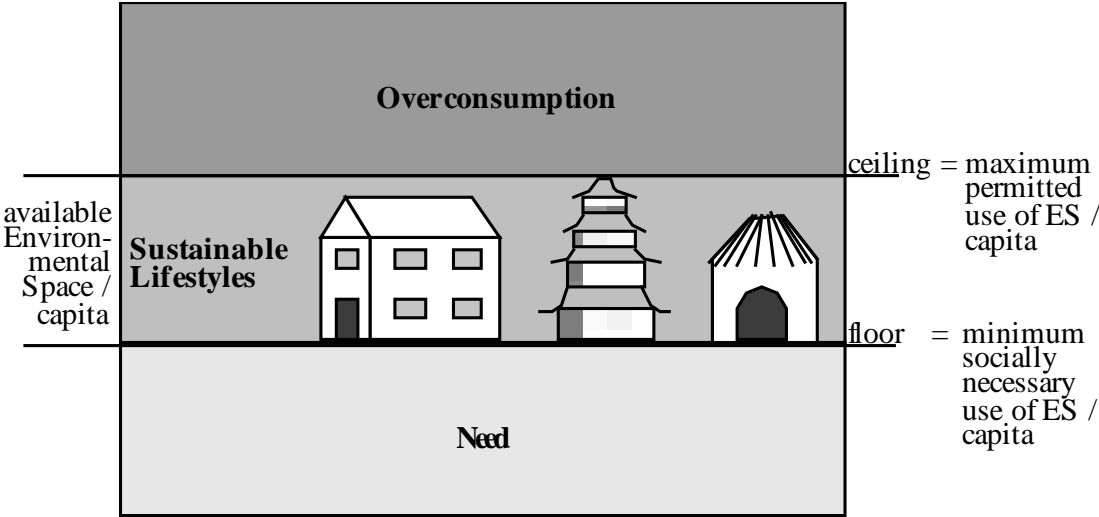
So sustainable consumption research broadly agrees on the main sources of the environmental burdens of consumption. In turn, key questions to be addressed are, ‘how can the impacts be reduced?’, ‘who should start changing?’, ‘with which tools?’, ‘in which time frame?’; and even the consideration of social or development aspects is neglected in many cases. This chapter addresses selected lines of argument from the broad literature on sustainable consumption.

Section 2 introduces the concept of environmental space. It explains why a floor as well as a ceiling for environmental space has to be considered and reflects on the space itself, its size and how to share it. Section 3 outlines some possible means of transition to reach environmental space from a position of overconsumption as well as from one of under-consumption. Section 4 then sharpens the focus for a more detailed analysis of two strains of concepts in sustainable consumption research and politics, distinguishing between strong and weak sustainable consumption, and section 5 outlines some enabling mechanisms for sustainable consumption. Section 6 concludes the arguments.

## 2 Consuming Within Limits

One of the early approaches towards sustainable consumption embedded it in the concept of *environmental space*. This concept was developed in the early 1990s in the Netherlands (Opschoor/Reinders 1991; Weterings/Opschoor 1994), and further elaborated in a European context (Spangenberg 1995). It distinguishes a space for free choice of consumption patterns from two zones of unsustainability: the domain of environmentally unsustainable overconsumption and one of socially unsustainable under-consumption. It is based on the insight of a limitation of various resources available for human consumption such as fossil energy, timber, and copper, as well as building and agricultural land.

**Figure 1:** The Environmental Space Concept. **Source:** Spangenberg (1995).



The two border lines as well as the environmental space itself all deserve a closer look.

### 2.1 The Floor

The lower level, called the ‘floor of the environmental space’ represents the minimum requirements of material (resource) consumption necessary to live a dignified life. In Latin America this line is known as *linea de dignidad*. It necessarily applies to every citizen because no one should live below it. A dignified life should not only satisfy the physiological needs of nutrition and shelter. The level also includes the availability of the resources needed

for actively participating in politics, culture, and the other processes of society (Cruz/Stahel/Max-Neef 2009; Max-Neef/Elizalde/Hopehayn 1989). The contributions of Nussbaum and Sen (1993) on the quality of life, especially their work on the capability approach (Nussbaum 2001; Sen 1999), are influential contributions to this context. Human well-being, living a good life, universal human rights (including social rights), and the extended definition of health by constituting a right to a minimum income—see the *Preamble to the Constitution of the World Health Organization* (United Nations 1948)—are further elements that help to create the idea of a floor with concrete requirements. To operationalize the floor, the concept of a *social protection floor*, developed and promoted by the ILO in collaboration with the WHO, plays a similarly important role (ILO 2011). This suggests measures and institutional reforms to achieve both basic income security and universal access to affordable essential social services. At the UN level, the Human Development Index published annually by the *United Nations Development Programme* (UNDP 2014) since 1990 reflects such considerations.

It is important to note that such a concept is not alien to economic thinking in general. Adam Smith, as early as 1776, stressed the necessity of providing all people with the means of leading ‘a life without shame’. However, its shortcoming is that it plays no role in current neoclassical economics (Lorek/Spangenberg 2014).

## 2.2 The Ceiling

The upper limit of the environmental space, called the ‘ceiling’, is the maximum use of resources as well as the maximal tolerable amount of environmental damage that the Earth can accept without destroying ecological systems in such a way that natural systems—and with them social and economic systems—collapse. Various studies have calculated upper thresholds on a per capita basis, including those for (auto-)mobility, water use and meat consumption, but also, for example, for the use of mineral resources (Buitenkamp/Venner/Wams 1992; Spangenberg 1995). The formal agreement to limit global warming to 2°C can be seen as such a ceiling. In their article in *Nature*, Rockström and twenty-eight colleagues took a broader approach and defined a ‘safe operating space for humanity’ based on ten criteria (Rockström/Steffen/Noone et al. 2009). This provides an extended empirical basis, emphasizing the key dimensions to care about since a significant (biodiversity, nitrogen cycle) or slight (climate) transgression of the acceptable limits to damage has already occurred, or is soon about to happen (phosphorus cycle, ocean acidification).

Taking CO<sub>2</sub> emissions as an example, a global per capita level respecting global climate change reduction targets would call for a 90 per cent reduction of CO<sub>2</sub> emissions for overconsuming affluent consumers (Chakravarty/Chikkatur/Coninck et al. 2009). To demonstrate what this reduction target could mean in practice, Swiss researchers and practitioners developed the concept of the ‘2000 Watt Society’ (Jochem 2004). According to their concept, 2000 watts per person would be a fair share of energy consumption for the global population. Interestingly, a comparison of energy use and the Human Development Index showed that the current energy supply is sufficient for a high level of human development for everyone if it is fairly shared. The issue is not the resource availability, but its distribution (Steinberger/Roberts 2009).

## 2.3 Size of the Environmental Space

What remains between floor and ceiling are specific consumption corridor(s) (Di Giulio/Fuchs 2014). The crucial question is what size these corridors are. Let us first consider the overall environmental space. At first sight it seems to be quite fixed, as planet Earth has a relatively constant surface. Nevertheless, to some degree it can vary. Research indicates, for

example, that the available productive land is shrinking—due to desertification, as a result of global warming and rising sea water levels, or simply through the overuse of renewable resources. As well as this, the amount of non-renewable resources is of course constantly depleting. On the other hand the volume could increase again—for example, if new energy sources were discovered and the energy problem were solved. This would allow land which is currently used for producing energy crops to be reallocated to food production. In addition, increasing effort is being spent to optimize technological solutions to sustaining and maximizing ecosystem services and the biocapacity of the Earth—but these include some debatable attempts such as geoengineering (Anshelm/Hansson 2014) and the development of *genetically modified organisms* (GMOs).

The overall size of the environmental space is of concern because it influences what the concept calls the ‘fair Earth share’ of resources per person. Accepting the general idea of similar rights for every human, environmental space should be shared as fairly as possible among the global population. So, after resource availability the fair share depends on population size. In his chapter “The Rise and Fall of Consumer Cultures” for Worldwatch Institute’s *State of the World 2010*, Assadourian calculated different possible numbers of a global population that could live in a sustainable way from Earth’s biocapacity (see table X.1). It would allow, for example, a global population of 13.8 billion to live within its environmental space if every person lived on a biocapacity of one global hectare. At the other extreme, the calculation demonstrates that our planet only could tolerate 1.4 billion people if everyone consumed in similar way to the average US citizen.

**Table 1:** Sustainable World Population at Different Consumption Levels. **Source:** Assadourian (2010).

Consumption level	Per capita income (2005) (GNI, PPP, 2008 dollars)	Biocapacity/person (global hectares)	Sustainable population at this level (billion)
Low-income	1,230	1.0	13.6
Middle-income	5,100	2.2	6.2
High-income	34,690	6.4	2.1
United States	45,580	9.4	1.4
Global average	9,460	2.7	5.0

This indicates that both population and affluence—taking technology into consideration—have to be targeted to limit consumption to a size that fits the available biocapacity.

**2.4 Critical reflections**

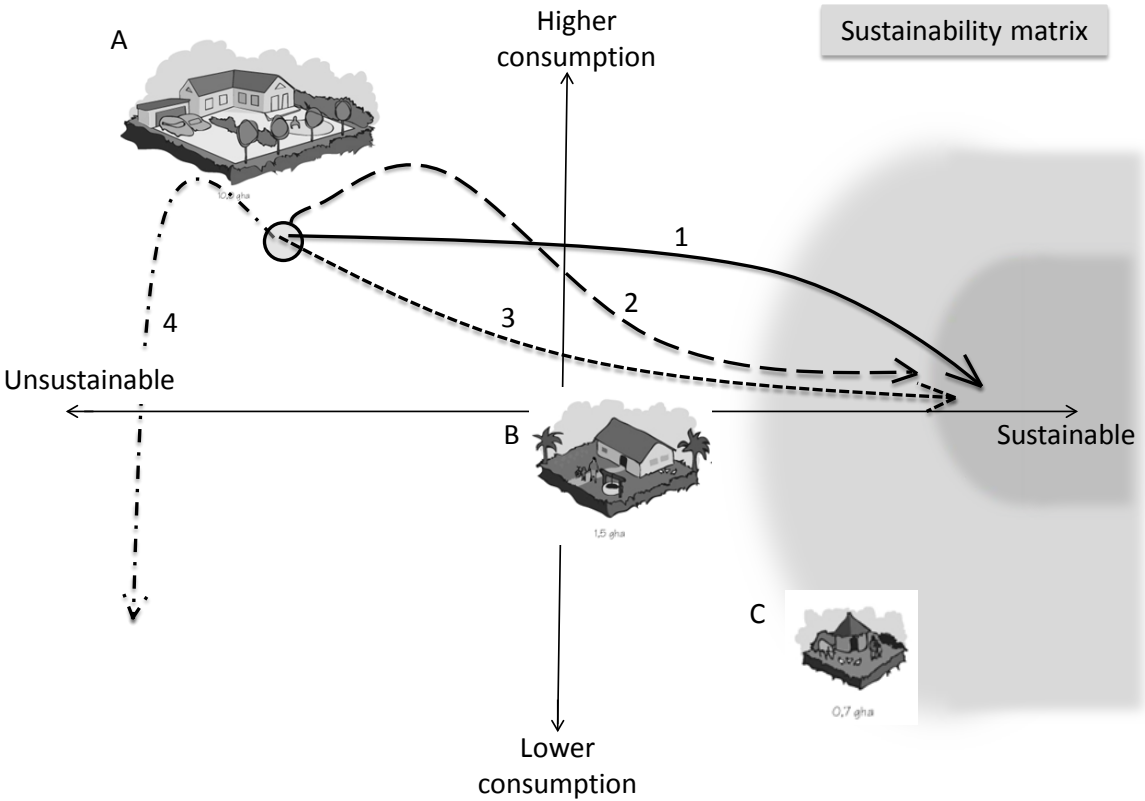
The more detailed the calculation of environmental space appears—at a country, city or personal level—the more difficult it is to develop precise recommendations in units of measure of specific resources. Nevertheless, the concept is relatively explicit in pointing towards both situations: where consumption is too high and where it is too low. Its main advantage, therefore, is its inherent call to increase equity of consumption opportunities (UNEP 2001). Accordingly, the concept is often used in the context of environmental justice (McLaren 2003; Rice 2007). The question of how to redistribute resources, however, is generally left open.

**3 Structuring Transition Paths towards Sustainable Consumption**

The crucial question is how to reach the environmental space from a situation of overconsumption as well as from one of under-consumption.

So far neither researchers, nor policymakers, nor members of civil society can agree on what a sustainable future might look like, despite a huge amount of modelling, visioning, and backcasting and forecasting exercises and scenarios. To illustrate some of the main lines of argument, this section uses a simplified matrix indicating over- and under-consumption on the y axis and sustainable/unsustainable stages on the x axis. As in table X.1, the environmental space in this illustration is represented through the *ecological footprint*, a resource accounting framework for measuring human demand on the biosphere measured in *global hectares* (gha) (Wackernagel/Rees 1996). The available environmental space for one person is assumed in this matrix to be around one gha on average. This stage of sustainability is illustrated by the dark grey field on the right-hand side of the sustainability axis. For the purpose of better visualization overconsumption is characterized by the big house in the upper left corner using 10 gha, while under-consumption is characterized by the small cottage using 0.7 gha. Figure 2 indicates some possible pathways through which overconsumption could shrink to a sustainable stage. Figure 3 outlines possible pathways by which under-consumption might be increased to a sustainable level. The arrows reflect possible pathways which can be related to typical strains of scientific and political argument.

**Figure 2:** Possible pathways to sustainable consumption from overconsumption. **Source:** Brunner and Urenje (2012).

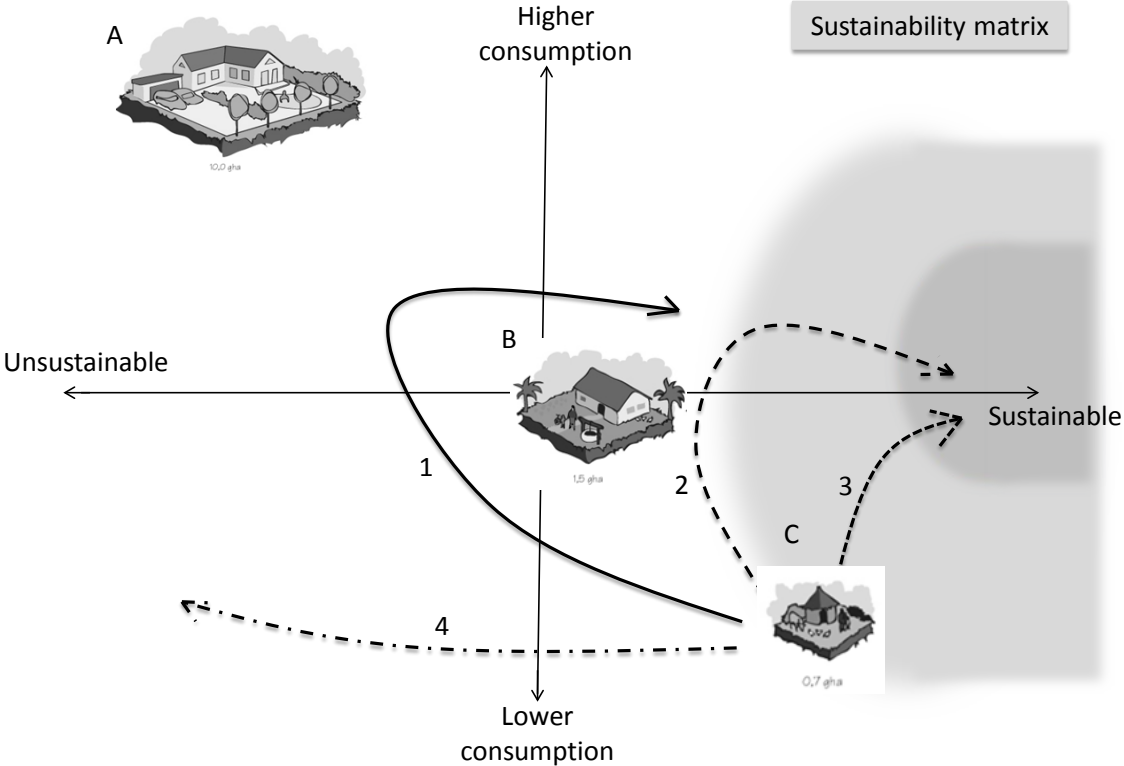


Arrow 1 in figure 2 describes how proponents of green growth (OECD 2011) and of the green economy (UNEP 2011) debate the possible transition towards sustainability. They argue that resource consumption can stabilize through improvements in efficiency and investment in green technology and will then slowly reduce. Others, such as the proponents of ecological modernization (Ayres/Simonis 1993; Ayres/Ayres/Frankl 1996), promote the development represented by arrow 2, where some further growth in consumption is still accepted in the expectation that technological innovation and resource productivity will soon reduce environmental burdens quite rapidly. The development of a new source of energy often plays

a crucial role in such an argument. The de-growth researchers (Demaria/Schneider/Sekulova 2013; Lorek/Fuchs 2013) argue instead that due to rebound effects economic growth always goes hand in hand with an increase in resource consumption and energy use—which is impossible in a finite world. As it is recognized that economies in developing countries need to grow to achieve equity, material throughput and energy use in developed countries need to de-grow immediately. This argument is illustrated by arrow 3. Finally, arrow 4 indicates what will probably happen under a business-as-usual scenario: continuous growth will eventually lead to an ecological and economic collapse.

Despite being an important political challenge the question of how to raise under-consumption towards a sustainable level is rarely the focus of sustainable consumption research (Lorek/Barber/Onthank 2013). It may be roughly considered that arrows 2 and 3 in figure 3 characterize some kind of leapfrogging. This term describes the immediate uptake of new, less resource-intensive technologies to raise living standards (Tukker 2005). Here, arrow 1 indicates a green growth model. This promotes high growth rates for underdeveloped countries in the expectation that in line with the Environmental Kuznet Curve (see for example Stern/Common/Barbier 1996) the environmental problems related to growth will decline again as soon as a specific level of income is gained and clean technology can be afforded. Then the path turns towards more sustainability. It has to be recognized, however, that it is mainly the arrow 4 path which is promoted by current development models and is the one most likely to be preferred by many people in developing countries. This path therefore represents the business-as-usual scenario.

**Figure 3:** Possible pathways to sustainable consumption from under-consumption. **Source:** Brunner and Urenje (2012).



SADC 2013

As indicated already, most academic and political debate about sustainable consumption is split between analysing and developing approaches and instruments for the pathways

characterized by arrow 1 and arrow 3 in figure 2. The next section will therefore further elaborate on the green growth/de-growth arguments.

## 4 The Search for the Best Way: Curing Consumption Impacts or Changing Consumption Patterns?

The core of the sustainable consumption discourse revolves around the question of whether sustainable consumption needs green growth, hence a *differentiation* of the actual growth model, or a de-growth path to shrink it towards a sustainable consumption level. De-growth proponents argue using the logic of ecological economics and perceive nature (or the environment) as the framing dimension of sustainability. In their argument, human society is perceived as a subsystem of nature and economics as a constructed subsystem of societies (Schneider/Kallis/Martinez-Alier 2010). According to these scholars the ceiling is so overstretched (Rockström/Steffen/ Noone et al. 2009) that it needs a substantial reduction in resource consumption first before something like a steady-state economy can be reached (Kerschner 2010; O'Neill 2012). Proponents of green growth logic appear to be more pragmatic. They see economic power as strongest in societies, and think that if it is wisely and strategically channelled it can best cure the impact of unsustainable consumption within the current economic system (OECD 2014b, 2014a). Proponents of both lines of thought, however, argue that the path they are suggesting will lead to a higher level of well-being for a larger share of the global population (box X.1).

### **Box X.1:** Green Growth and De-growth.

*Green growth* means fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being depends. It focuses on the synergies and trade-offs between the environmental and economic aspects of sustainable development, but also considers the social aspect on the basis that without good governance, transparency, and equity, no transformative growth strategy can succeed. One important component in promoting green growth is the provision of the right economic incentives for influencing household decisions. Soft measures, however, such as labelling and public information campaigns also are recognized as having a significant complementary role. Therefore, the desired change in behaviour will require a mixture of these instruments

*De-growth* means a deliberate downscaling of production and consumption in order to increase human well-being and enhance ecological conditions and equity on the planet. It calls for a future where societies live within their ecological means, with open but mainly localized economies, and where resources are more equally distributed through new forms of democratic institutions. A de-growth understanding of innovation focuses on new social and technical arrangements that enable individuals and societies to live convivially and frugally. In this context, de-growth challenges the centrality of GDP as an overarching policy objective. De-growth explicitly seeks a sustainable shrinking and differentiates itself from the involuntary and painful processes of austerity or recession.

Translating green growth and de-growth into the terminology of sustainable consumption, the relevant literature distinguishes in this context between strong sustainable consumption closer to the path of de-growth and weak sustainable consumption via a green growth path (Berg 2011; Fuchs/Lorek 2005; Hobson 2013; Lorek/Fuchs 2013).

Weak sustainable consumption proponents more or less take the current consumption levels as given and so encourage every effort to satisfy them with fewer resources (European Commission 2008). They see the prevailing market economy, based on free choice and



consumer sovereignty, as a powerful vehicle in this context. Governments, research organizations and civil society organizations who follow this path stress their respect for individual lifestyle choices, and point out that market economy systems (as actually structured) need to constantly increase consumption in order to sustain the economy and especially to sustain full employment. Thus—in the name of sustainable consumption—interventions are carefully calibrated to address environmental problems while not slowing down the economy. They accordingly promote and foster initiatives through which sustainable consumption can be achieved via an increase in the efficiency of products, production processes, services, and the provision of these services.

Others, however, argue that this reduces sustainable consumption to sustainable consumer procurement only (Fedrigo/Hontelez 2010). In fact, in this weak form the concept of sustainable consumption is often used to argue that it is consumers who should shift the market towards sustainability and that interventions should focus on urging consumers to improve the sustainability characteristics of their consumption choices as well as on enabling consumers to do so (Fuchs 2013). Akenji (2014) blames this attitude for making consumers the scapegoats of unsustainability.

Strong sustainable consumption researchers—and thus de-growth advocates—in their turn perceive consumers as locked in to consumption practices through their habits and routines, as well as to the structural constraints resulting from the technological, socio-economic, political and cultural environments they are living in (Cohen/Murphy 2001; Maniates 2001; Røpke 1999; Sanne 2002; Shove 2010). According to their logic, the change of structure has to be the focus. These scholars also support and appreciate the availability of environmentally or socially superior products in markets and the provision of relevant information to consumers as necessary preconditions for change. However, they claim this can only be a starting point because most decisions about sustainable or unsustainable consumption paths take place hidden from the consumers' sphere of influence. Changes in communication technologies, global finance and trade have developed a remarkable influence on the sustainability of consumption long before the consumer ever makes a choice. A similar situation is found with demographic and gender roles which, for example, induce shifts in job situations and time allocation with remarkable consequences for patterns of household consumption (Fuchs/Lorek 2002; Ropke/Godskesen 2007). What seem to be individual decisions or individual lifestyle characteristics are in fact systematic societal shifts which make individual sustainable lifestyles less and less possible.

Although this dichotomy between weak and strong sustainable consumption describes two divergent streams of thought and practice, there are conceptual and practice-based spaces where they intersect (Hobson 2013). As soon as it comes to detailed activities weak (because technology-based and/or efficiency-based) instruments might build a necessary condition into a strong sustainable consumption scenario, at least to win time. The uptake of e-mobility through e-bikes might serve as an example. As a technological innovation they can pave the way for a modal shift in mobility—as long as they indeed replace cars and not ordinary bicycles (Rose 2012). The line between weak and strong sustainable consumption is sharply drawn insofar, however, as the search for transition paths are either restricted to solutions possible within the current system or actively envision demand for and support for a change in the system(s).

A widely neglected aspect in both strains of discussion so far about why consumption habits and structures have developed and seem to be developing further in the direction of unsustainability is the question of power. Power plays a central role in creating structural barriers to sustainable consumption and in delimiting opportunities for intervention. Actors typically mentioned in regard to executing power over consumption structures are administrations from global to local level, business companies and organizations, civil society organizations, media, and last but not least individuals, whether acting as consumers in their

daily household context or as engaged citizens. However, the relationship between power and sustainable consumption is only just beginning to be analysed (Fuchs/Di Giulio/Glaab et al. forthcoming). Research so far highlights the close relationship between sustainable consumption and fundamental questions of democracy: how can one assure equality in participation in today's democracies, characterized as they are by large asymmetries in resources and access to institutions and decision-makers? (Fuchs 2013).

## 5 Enabling Mechanisms for Strong (or Weak) Sustainable Consumption?

At the present time, researchers and practitioners are exploring and proposing imperatives and implementation mechanisms for fostering the sustainability of consumption. A literature review has identified eleven main ways in which sustainable production-consumption systems could be made possible (Lebel/Lorek 2010). These are presented in table 2, and range from initiatives which emphasize production activities to those which are more consumption-related. At first view, some of the mechanisms appear to follow a weak sustainable consumption approach, in that they try to optimize the system from within, through 'greening the supply chain' or 'certify and label'. Others indicate a rethinking of the system, through 'use less' or 'service rather than sell'. Here we can already see that strong sustainable consumption approaches are not limited to those parts of the product chain which are traditionally linked to consumer activities. In the end, however, to stay within the environmental space all the mechanisms will have to be developed further:

**Table 2:** Examples of enabling mechanisms for sustainable consumption. **Source:** Lebel/Lorek 2010.

Enabling mechanism	Short description	Concerns, constraints, or challenges
Produce with less	Innovations in production process reduce the impact per unit made.	Rebound effects occur through which gains are wiped out by increases in the number of units or how they are used.
Green supply chains	Firms with leverage in a chain impose standards on their suppliers to improve environmental performance.	There may be unfair control of small producers.
Co-design	Consumers are involved in design of products to meet functions with less environmental impact.	Incentives are not adequate to involve consumers.
Produce responsibly	Producers are made responsible for waste from the disposal of products at the end of their life.	Incentives for compliance without regulation may be too low for many types of products.
Service rather than sell	Producers provide service rather than sell products; this reduces the number of products made while still providing to consumers the functions they need.	This is a difficult transition for firms and consumers to make as it requires new behaviours and values.
Certify and label	Consumers buy labelled products. As labels are based on independent certification, producers with good practices increase their market share.	Consumers are easily confused by too much information or by a lack of transparency and credibility in competing schemes.
Trade fairly	Agreements are made with producers that may include minimum price and other investments or benefits. Consumers buy products labelled as or sold through fair trade channels while producers get a better deal.	Mainstream trade still dominates. It is hard to maintain fair trade benefits to producers when a product becomes mainstream.
Market ethically	Reducing unethical practices in marketing and advertising would reduce wasteful and overconsumption practices.	There is reluctance by policymakers to tackle very powerful private sector interests with regulation.
Buy responsibly	Campaigns that educate consumers about impacts of individual products, classes of products and consumption patterns change behaviour overall.	Converting intentions and values into actions in everyday life is often difficult for consumers. Issues of convenience, flexibility, and function still matter a lot.
Use less	Consumption may be reduced for a variety of	There is a dominant perception that using less

	reasons, for example, as a consequence of working less. There are many potential environmental gains from less overall consumption.	means sacrifice. Less income and less consumption may not automatically translate into better consumption impacts.
Increase wisely	Increasing consumption of under-consumers can be done in ways that minimize environmental impacts as economic activity expands.	Wealthy developed countries need incentives and goodwill to assist the poor and those in developing countries, for example, by leaving adequate space and natural resources for them to develop.

## 6 Conclusion

Our consumption is embedded in the boundaries of our natural system but shaped by economic, societal and cultural structures. To direct consumption towards sustainability, the concept of *environmental space* can provide useful orientation. It helps us to visualize how consumption can be unsustainable if it exceeds an upper as well as a lower limit. What exactly these upper and lower limits are, however, has not yet been sufficiently well formulated. Even less well formulated are concrete suggestions about how to reach the safe operating space which is appropriate for the consumption of countries, regions or individuals. What is being debated is what the best pathway is that such a development should take in order to achieve sustainable consumption. This paper has developed arguments for a green growth path that relies on the transformative capacity of the economic system and respects and highlights consumer sovereignty. These conditions are recognized as a necessary but probably insufficient condition for (global) consumption patterns that remain within environmental limits and so characterize a weak sustainable consumption path. The second strain of argument reflected is for a de-growth path which demands a shrinking of economic activities, investing in research and directing policies into a change of systemic structures, including the framing conditions for the economy. Such a development would require strong sustainable consumption governance. Research into this path still has to convince its opponents that the idea envisioned of a sustainable shrinking does not lead to the collapse of economic and social security systems, for example, and is completely different from austerity or recession situations. Various enabling mechanisms to foster sustainable consumption have been identified. They are ready to be used in any way.

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