The role of business models for sustainable consumption: A pattern approach

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1. Introduction

1.1 Navigating the sustainable consumption corridor

In October 2018, the International Panel on Climate Change (IPCC) published a special report on the impacts of greenhouse gas (GHG) emissions and related global warming. The researchers are highly confident that: ‘1.5°C pathways that include low energy demand . . . low material consumption, and low GHG-intensive food consumption have the most pronounced synergies and the lowest number of trade-offs with respect to sustainable development and the SDGs [Sustainable Development Goals] . . .’ (International Panel on Climate Change, 2018: 21).

This indicates how closely consumption and climate change – but also other forms of ecological and social collapse – are related. Remaining below 1.5°C warming requires strong sustainable consumption (SSC), that is, staying within absolute ecological limits of resource use and resultant GHG emissions (Spangenberg, 2014). In addition, striving for sustainable consumption also entails eliminating socially unsustainable levels of consumption due to poverty and other barriers such as unequal educational opportunities (Spangenberg, 2014). The socially acceptable minimum of consumption possibilities is defined by social values such as human dignity and justice, taking into account the conditions for active participation in society (for example, political engagement, education, culture) (Spangenberg, 2014).

The conventional idea is to achieve such minimum standards by means of economic growth. However, proponents of degrowth, among others, criticize this approach because they estimate the risk of ever increasing impacts on the biosphere as being too high to pursue economic growth on a global level, particularly with respect to already affluent world regions (Weiss and Cattaneo, 2017). Accordingly, the debate on degrowth revolves around a liberation from the growth ideology as well as ‘a radical call for a voluntary and equitable downscaling of the economy towards a sustainable, just, and participatory steady-state society’ (Weiss and Cattaneo, 2017: 220). Contributions in this realm refer to insights indicating that sustainable levels of consumption also have an upper limit from a social point of view.
For example, Kallis (2015), referring to Hirsch (1976), points out that people in affluent societies spend their income increasingly on positional consumption. Yet, if consumption is progressively based on a competitive comparison with others, then, ultimately, it jeopardizes leisure time, sociability and social relations. It takes up time that could be spent on political and other societal engagement. This calls for individuals to consider maximum consumption levels (Di Giulio and Fuchs, 2014).

Considered together, SSC represents a ‘corridor’ which, as illustrated in Figure 6.1, has both a floor and a ceiling. The floor represents the social foundations for a decent life for all people around the globe, that is, minimum access to the natural and social resources required for human dignity and active participation in society (Spangenberg, 2014). Certainly, towards and within the SSC corridor, different pathways are conceivable and the option for differences in individual consumption remains. To a certain extent, technological and organizational innovations may lift the ceiling for sustainable consumption of products and services. Still, even technological and other innovations have limitations with regard to resource availability and thus leave resource consumption in a range with clear – that is, absolute – limits. As a consequence, the space left between the corridor’s floor and ceiling is the space left for collectively achieving SSC. Hence, the corridor’s ceiling can be defined by ‘maximum standards for every individual’s use of resources guaranteeing access to sufficient resources (in terms of quantity and quality) for others, both in the present and the future’ (Di Giulio and Fuchs, 2014: 184). But as indicated above, these are not just planetary boundaries of a ‘safe operating space for humanity’ (Steffen et al., 2015) but also of social and societal limits to sustainable consumption.

Consequently, we must ask: how can social and individual well-being be secured by supporting degrowth and restructuring consumption patterns to stay within the
SSC corridor? How can life be improved for those suffering from malnutrition, for example, without us collectively ‘bumping our heads’ against the ceiling? Defining and achieving SSC is closely linked to the quest for a good life, which refers to a broad and well-balanced spectrum of human needs (see Chapter 2 by Lorek and Fuchs in this volume). It is not just about the consumption of commodities and services but also about non-material factors such as safety, feelings of belonging and equity (Lorek and Fuchs, 2013). This implies that SSC is not merely an economic challenge, but also one involving many societal actors (for example, businesses, non-governmental organizations (NGOs) and governments) who care about values and cultural aspects of production and consumption beyond business success and individual distinction.

Indeed, SSC requires a socio-cultural and economic transition away from a social paradigm that emphasizes ever more production and consumption, to one that promotes sustainable levels of consumption (Lorek and Fuchs, 2013). Thus, approaches to improve consistency, efficiency, and sufficiency (including degrowth) are called for in the industrially and economically developed regions of the world – particularly with regard to the reduction and replacement of the most energy- and resource-intensive fields of consumption (for example, replacing energy from lignite with renewables, or avoiding air travels) (Stengel, 2011). At the same time, growth and access to consumption opportunities is required in those regions, respectively for those social groups that do not benefit from increases in global wealth (Spangenberg, 2014). In addition, transition countries may face both challenges simultaneously.

This then implies questioning which human needs are addressed by certain modes of production and consumption, and to what extent (Lorek and Fuchs, 2013). It raises questions such as how to move from owning to sharing goods (Mont, 2002; Mont and Tukker, 2006), or how to make use of marketing techniques that favour more responsible consumption styles (Belz and Peattie, 2013). From a business perspective, this leads to challenges at the very heart of the core businesses of companies: how can companies, as the key designers of production–consumption systems, help society to navigate safely through the SSC corridor? What are the sustainability strategies and business models that support SSC? What is the role of business models, and which options to develop alternative business models are available today?

1.2 Outlook on the chapter

The next section will discuss major strategies for sustainable production and consumption and introduce sustainable business model (SBM) patterns as a way of supporting these strategies within the framework of SSC. Building on our prior work in this domain (Froese, 2017; Lüdeke-Freund et al., 2018a; 2018b; 2019a; 2019b; Schaltegger et al., 2012; 2016), the authors of this chapter will discuss the link between business models and SSC and introduce a framework focusing on sustainability strategies and SBM patterns. Finally, we will introduce some new
ideas on how SBM patterns could be used by business model designers to tackle SSC challenges.

2. The link: Sustainable consumption and business models

Business models are used to describe, analyse, communicate and design the value creation logic of companies and other types of organization, which includes their value propositions as well as value creation, delivery and capture mechanisms (Massa et al., 2017). Within this domain, business model research and practice that deal with sustainability challenges are rather new (Lüdeke-Freund and Dembek, 2017). According to the core assumptions of this new field, well-designed and successfully implemented business models are expected to create value not only for the company, its customers and business partners but also for other stakeholders, such as groups concerned about the natural environment, local communities or otherwise neglected social groups. In line with this, the notion of a business model for sustainability has recently been defined as ‘describing, analyzing, managing, and communicating (i) a company’s sustainable value proposition to its customers and all other stakeholders, (ii) how it creates and delivers this value, and (iii) how it captures economic value while maintaining or regenerating natural, social, and economic capital beyond its organisational boundaries’ (Schaltegger et al., 2016: 6).

But how do business models and SSC interrelate? Many ways of conceptualizing this relationship exist since business models are multidimensional constructs that offer various options, for example, in terms of value proposition design, alternative production processes or managing customer relationships. These business model design options can be used to address certain challenges of SSC, such as the repeatedly observed attitude–behaviour gap: most consumers state that they would prefer more sustainable forms of consumption (for example, healthy and organic food), but only a minority behaves accordingly (see for example, Belz and Peattie, 2013). This observation points to some fundamental barriers that inhibit SSC from the consumer side, such as the lack of information about better offers, the lack of convenience when using alternative products or services or the lack of additional services that help reduce consumption footprints (for example, take-back systems). Figure 6.2 displays exemplary barriers in the different phases of the consumption process.

Business models can be seen as market devices that connect sustainability innovations like ecologically and socially benign products to existing or new markets and thus connect supply and demand (Boons and Lüdeke-Freund, 2013; Doganova and Eyquem-Renault, 2009). Modifications to existing business models and the development of new ones may help to overcome SSC barriers, for example, by offering dematerialized services instead of physical products to increase consumer convenience (Tukker, 2015), or improving the accessibility of health care or education in less developed regions through alternative financing models (Seelos and Mair,
It can be concluded that business models bear the potential to support SSC: first, because they function as market devices that bring sustainable consumption alternatives to the market, which can complement or replace conventional offers (for example, Schaltegger et al. 2016), and, second, because they are multidimensional ‘tools’ that offer a broad range of design options.

The former point (market device) can be illustrated with the impressive case of Aravind Eye Care Systems, an Indian eye care hospital chain offering high-quality medical treatments for free to half of its patients (Seelos, 2014). This is possible because Aravind uses a social freemium business model. The latter point (multitude of design options) is illustrated by a study on circular economy business models, which concludes that (theoretically) millions of options to design business models for the circular economy are possible (Lüdeke-Freund et al., 2018b).

**Figure 6.2** Barriers to SSC in the consumption process

In many cases, the use phase accounts for most of the sustainability impacts of a product (e.g., washing machine). Use phases are artificially shortened to accelerate new purchases – how to motivate longer use, re-use, repair, maintenance?

Different behaviours lead to different impacts in the post-use phase: disposing of the product, reuse, recycle, remanufacture, selling, trading, giving to others (including charities), renting the used product, storing it, use it for different purposes.

Source: Based on Belz and Peattie, 2013.
3. Business models for sustainable consumption: Strategies, cases and criticism

3.1 The framework

Using business models as market devices that offer a broad range of design options allows for a systematic and, to a certain degree, replicable development of operational activities that contribute to more sustainable production–consumption systems. But how can business models for SSC be developed, and how can they become effective? We propose that this can be achieved by using business model patterns that guide the adaptation, innovation or even the complete redesign of business models in line with sustainability strategies (Schaltegger et al., 2012), as illustrated in Figure 6.3.

As every business model follows an implicit or explicit strategy, conventionally with the goal of improving a company’s competitive positioning and financial performance (Casadesus-Masanell and Ricart, 2010), we contend that sustainability strategies can also guide business model design to include criteria of ecological and social effectiveness and efficiency, as well as the SSC corridor, in strategic planning, business modelling and implementing operational activities. The next section elaborates on major sustainability strategies which could serve this purpose.

These strategies can help in selecting and developing SBM patterns (Lüdeke-Freund et al., 2018a; 2018b; 2019a) as a source of inspiration and a tool to develop business models for sustainability supporting SSC. The notion of ‘pattern’ comes from domains such as design or architecture. Alexander et al. (1977: 17) define that a pattern ‘describes a problem which occurs over and over again in our environment and then describes the core of the solution to that problem in such a way that you can use this solution a million times over without ever doing it the same way twice’. Patterns are problem–solution combinations that can be repeatedly applied in different contexts. This allows learning from past experiences and increases the efficiency of design processes. Patterns have always been part of business model research and practice, whereas their relationship to sustainability considerations has only recently been defined (Lüdeke-Freund et al., 2018a: 148):

A sustainable business model pattern describes an ecological, social, and/or economic problem that arises when an organisation aims to create value, and it describes the core of a solution to this problem that can be repeatedly applied in a multitude of ways, situations, contexts, and domains. A sustainable business model pattern also describes the design principles, value-creating activities, and their arrangements that are required to provide a useful problem-solution combination.

Finally, the framework proposes that business model patterns can be used to define the operational activities of companies (Gassmann et al., 2014), that is, their value-creating activity systems (Zott et al., 2011). Designing business models in support of sustainable production–consumption systems is thus about creating operational
Sustainable business model patterns
Describe ecological, social and/or economic problems that arise when organizations aim to create value. They describe the core of solutions to these problems that can be repeatedly applied in a multitude of ways, situations, contexts and domains.

Sustainability strategies
Define overarching goals and pathways to design efficient, sufficient, consistent and socially just systems of production and consumption.

Business models for sustainability
Representation and definition of value-creating activities targeting the improvement of business case drivers

Operational activities
Translate strategies and business model patterns into operations that develop, maintain or enhance sustainable production-consumption systems.

Sustainable production-consumption systems
Production-consumption systems that respect the ‘safe operating space’ of ecological systems and promote socially equal production and consumption opportunities.

Source: Based on Lüdeke-Freund et al., 2019b.

Figure 6.3 The interplay of sustainability strategies, business models and production–consumption systems
activity systems that help companies and consumers to navigate through the SSC corridor.

3.2 Strategies for sustainable production and consumption

The question that follows on from the previous considerations is how business model design can support companies and consumers in achieving their personal values and ideals of a good life. Any proposed answers to this question must fit in with the SSC corridor as discussed in this chapter’s introduction. Considered together, this leads to the following question: how can companies, in an economically feasible manner, support consumers in not, or no longer, collectively overshooting ecological boundaries while achieving a socially balanced level of, and access to, meaningful consumption opportunities?

To approach this essential question, we propose taking a look at a set of strategies presented by Huber (2000) in the early days of the global sustainable development debate: efficiency, consistency and sufficiency. In addition, this strategy triad must be accompanied by socially oriented considerations about fair inclusion, due to important social and cultural aspects. It is important to consider the interplay between these four types of strategy and their mutual influence on each other. Thus far, they have mostly been used in isolation, which should be avoided in system design, such as value-creating activity systems (for instance, business models) and production–consumption systems. Even well-intended strategies such as efficiency or sufficiency can have unintended consequences (for example, rebound effects or decreasing consumer convenience), which can backfire and create higher barriers to future action on SSC. Considering the interplay of these strategies is one way of avoiding such negative side effects.

3.2.1 Efficiency strategies

To begin with, efficiency strategies aim at improving the ecological input–output relations of existing production–consumption systems (Huber, 2000). Typical examples are energy-efficient light bulbs and lean production processes. At best, efficiency decouples increases in consumption and profit-making from resource use (Bartelmus et al., 2004). Correspondingly, ‘[t]he efficiency strategy is the most applicable and appealing in the prevailing economic system’ (Huber, 2000: 280).

The latter, however, may also be its greatest shortcoming. Striving for eco-efficiency is tempting, but it does not always guarantee eco-effectiveness, that is, achieving the absolute goals of SSC. To take one example: once a type of product – be it cars or drilling machines – is open to sharing, less production of the same is required. Consumers might even be able to afford access to higher quality products that last longer or can share repair costs. All these aspects increase use efficiency. Indeed, certain sharing business models such as car sharing are clearly gaining in acceptance and are rapidly scaling up. Consumers who were not able to afford a car, and thus relied on their bike or public transportation, could now choose to use a car...
more often. Thus, while some might no longer own a car, others will use less public transport. Moreover, with regard to former car owners, sharing potentially sets free financial resources that can be used for additional consumption in other areas leading to indirect rebound effects (Chitnis et al., 2013).

Considered together, efficiency can help reduce environmental impacts and resource use and thereby support competitiveness. Yet, instead of supporting alternative production and consumption practices, improvements in eco-efficiency may also be used to legitimize traditional technologies and structures (for example, individual car traffic). Hence, it may also lead to lock-in and path-dependencies and even stimulate demand through reduced costs ('Jevons paradox', also known as the rebound effect (see Polimeni et al., 2008)). Whether the overall effect of applying an efficiency strategy is positive, large or small thus depends on many interrelated aspects and may often not be clear.

3.2.2 Consistency strategies

Against the background of such shortcomings, Huber (2000) considers consistency as the means for opening up a truly sustainable development path. Following Huber (2000: 280, italics in original), consistency is ‘a strategy of qualitative change of the industrial metabolism . . .’. The idea of consistency is to create material and energy flows in technological or biological cycles that are either completely separated from, or perfectly compatible with, natural material flows of the biosphere (Braungart et al., 2007). Examples are eco-farming, which contributes to soil quality and biodiversity, or products such as bio-based detergents, designed and produced according to cradle to cradle (C2C) principles.

While some problems of the efficiency strategy are not inherent in the consistency strategy, this approach also faces limitations. Producing biodegradable packaging, for example, could require biomass production in monocultures and cause related problems of biodiversity loss, erosion, and so on. Furthermore, closing technical loops can reduce production costs and consumption after some loops and thus also cause the income effect described above, leading to additional production and consumption.

Furthermore, when Huber discussed this strategy nearly 20 years ago, he stated that asking for practical examples or corresponding predictions is tempting but ‘difficult and risky, if not impossible’ (Huber, 2000: 281). Yet even today, truly convincing examples are still rare. Consistency goes beyond improved product and production design and requires consonant solutions along the entire life cycle of a product and the corresponding consumption processes (see Figure 6.2), including customer education and take-back services (Belz and Peattie, 2013; Lüdeke-Freund et al., 2018b). In fact, taking the idea of consistency seriously implies thinking about future generations of products and services, too. Thus, consistency strategies imply systemic innovations that conflict with existing dominant designs and interests of incumbents. This becomes even more relevant
if we consider that mobilizing the necessary innovative and economic capacities actually requires multi-level efforts and support from industry, finance, research and political leadership, as well as social acceptance on an international level (Huber, 2000).

All things considered, while consistency and efficiency bear the potential to extend the height of the SSC corridor’s ecological ceiling, they have (so far) fallen short of aligning it with humanity’s actual impact on the biosphere (see Steffen et al., 2015). This then demands sufficiency, that is, renunciation, modesty and being satisfied with less – particularly from affluent consumers (Stengel, 2011).

3.2.3 Sufficiency strategies

Based on considerations of the earth’s carrying capacity and resource scarcity, in combination with ethical claims for distributive justice and solidarity, sufficiency strategies aim for shifts in cultural values, institutions and practices of production and consumption. This approach is typically expressed in phrases such as ‘sufficiency means doing without’ (Huber, 2000). Accordingly, sufficiency includes reduction of resource use and impacts on the natural environment, substitution of non-sustainable practices and stimulation of altered consumer habits. Still, transferring the sufficiency principle to the dominating, growth-driven business world (and private domains of consumers) is challenging.

To briefly discuss an exemplary case, Bocken and Short (2016) refer to Patagonia, an icon in the area of sustainable clothing, as an example of a sufficiency-driven business model. Patagonia is said to produce useful, lasting products, to offer repair and recycling services and even to attempt having their customers reflect on whether they truly need new clothing. Altogether, this suggests that Patagonia’s management aims at supporting their customers in adopting more sufficient lifestyles. Yet here, too, objections can be made (Hepburn, 2013; Khmara and Kronenberg, 2018). Patagonia’s marketing activities include statements as radical as Don’t Buy This Jacket, which, in effect, create a highly attractive brand. Thus, Khmara and Kronenberg (2018: 729) conclude that, for the vision of people living happily with less, ‘... Patagonia is not a good example (although neither is hardly any other company)’. Ultimately, Patagonia sells high-priced status symbols to a growing community of ‘involved’ consumers (Hepburn, 2013).

Nevertheless, acknowledging that ecological (and social) boundaries must be respected, sufficiency-oriented business strategies and business models are called for. To be effective these must overcome several critical barriers, ranging from psychological and behavioural barriers on the individual level, to a culture of consumerism and a growth paradigm dominating business and political economics (Huber, 2000; Lorek and Fuchs, 2013). What is more, even if sufficiency sets free ecological capacities (for example, unused natural resources or forests’ capacity to absorb CO₂), which are then safe to be used, this does not directly address the issue of fairly distributing these free capacities.
In conclusion, the introduced strategies must be accompanied by a fourth type of strategy that specifically contributes to an inclusive and fair distribution of available production and consumption opportunities within the SSC corridor.

### 3.2.4 Inclusion strategies

Based on the considerations above, we add a fourth sustainability strategy under the umbrella of ‘social inclusion strategies’. Approaches that can be attributed to this socially focused strategy type are, for instance, forms of social or inclusive business (Yunus et al., 2010).

On the one hand, business models can focus on including fringe groups in value creation and delivery activities to ultimately have them participate in SSC. For example, business models can make use of homeless people’s local knowledge or the tactile sense of blind people. Yet, to avoid crossing the thin line between inclusiveness and exploitation, measures such as flat governance structures, balanced salaries, cooperation with NGOs or external supervision are called for (Lüdeke-Freund et al., 2016). On the other hand, inclusion can be focused on the fair redistribution of access to production and consumption opportunities. Here, we see some potential, for example, in freemium business model patterns. These are based on the idea of having affluent consumers pay a premium price, which is then used to subsidize poorer people’s access to a product or service (for example, the aforementioned example of Aravind Eye Care Systems; see also Seelos, 2014).

Yet, focusing solely on inclusion strategies bears the risk of being ecologically adverse. For example, eradicating poverty by merely increasing the poor’s access to consumption is hardly in line with achieving ecologically feasible levels of resource consumption or GHG emissions. Staying within the confines of the SSC corridor thus requires combining different ecologically and socially oriented strategies.

### 3.3 From trade-offs to complementary strategies and business model design

Building on the above considerations, we argue that entrepreneurs and managers must find ways to translate the notion of living a *good life* within the SSC corridor into actionable blueprints for their value creation activities. When doing so, they will face absolute ecological, social and economic goals associated with SSC, which must be considered in relation to one another: What trade-offs might occur? (see for example, Hahn et al., 2010) However, taking a different perspective, we argue that the designers of business models for SSC need support in their search for complementary and mutually reinforcing strategies and design options, for example, in order to commercialize products that are healthier, more efficient and effective, and to allow producers to compete in the market (such as Seventh Generation’s carcinogen-free detergents, which are not only healthier but also more effective than competing cleaning products (Environmental Defense Fund, n.d.). Aiming for such complementarities, instead of focusing on trade-offs, might sound illusionary.
or maybe even naive. Still, we assume that this perspective bears the potential to motivate a successful search for new and creative solutions.

The available solution space in the search for complementarities and balance between the different sustainability strategies and associated goals of SSC can be illustrated with a ‘sustainability triangle’ (Schaltegger and Burritt, 2005). The triangle view starts with putting one sustainability dimension at each corner of an isosceles triangle (Figure 6.4). Contributions to the individual dimensions can be measured in absolute terms (for example, tons of CO2 avoided or number of people having access to healthy nutrition). This means that achieving social, ecological and economic goals is considered separately as a matter of effectiveness. However, as discussed above, the sustainability strategies should also be examined in relative terms, that is, in relation to each other. The same holds for sustainability contributions resulting from these strategies. For example, the economic effectiveness of increased sales volumes could contribute to reaching social objectives but could also conflict with protecting natural resources. In other words, increasing sales volumes may reveal social-economic efficiency, yet also a negative correlation of

Source: Lüdeke-Freund et al., 2018a.

Figure 6.4 Triangle view on SBM patterns
economic and ecological measures. The integration of all sustainability dimensions can therefore be defined as the overarching goal of designing business models for SSC, that is, to achieve positive contributions, or at least no step backwards, in all dimensions.

4. Business model patterns for sustainable production–consumption systems

An example of applying a sustainability triangle to explore the design options for business models supporting SSC is demonstrated in Figure 6.4. This builds on the ‘integrative sustainability triangle’ by Kleine and von Hauff (2009), which is used to structure SBM patterns according to their expected value creation potential. Eleven SBM pattern groups are mapped against different forms of value creation (Lüdeke-Freund et al., 2018a).

The closer a pattern group (respectively the individual patterns in this group) is to one of the corners of the triangle, the more it is associated with value creation in the respective sustainability dimension. Partial associations imply that a pattern is expected to contribute to multiple forms of value creation and, accordingly, is arranged more centrally between the corresponding dimensions. Thus, the centre represents the special case of patterns integrating ecological, social and economic demands. The arrangement of patterns relative to their assumed value creation potential results from an expert consensus, that is, it reflects the expectations of researchers and practitioners and thus builds on theoretical as well as practical knowledge (Lüdeke-Freund et al., 2018a). Patterns codify and pass on this knowledge in a very efficient way, which allows designers to use this knowledge directly without any further ‘translation’. Patterns addressing similar or related sustainability challenges, such as closing material or energy flows (pattern group 4 in Figure 6.4), form a group. In total, the eleven groups comprise 45 individual SBM patterns, one of which is shown in Table 6.1. The description of each pattern is standardized and follows a template including information about the problem it addresses and the solution it offers, the context in which it can be applied as well as related patterns and examples.¹

The ‘Differential Pricing’ pattern shown in Table 6.1 belongs to the Pricing and Revenue pattern group shown in Figure 6.4. It exemplifies how multiple barriers to SSC can be addressed by applying SBM patterns, and, even more so, by combining different patterns. While the notion of ‘Differential Pricing’ – offering different prices for the same product or service to different target groups – is not new and has been used across diverse industries, the idea of combining this pattern with other patterns (such as ‘Access Provision’ or ‘Closing-the-Loop’ patterns) opens up new ways of designing SBMs in general and business models for SSC in particular. The ‘Differential Pricing’ pattern could thus serve as one approach for companies to achieve inclusion strategies while navigating through the SSC corridor.
Using SBM patterns in combination leads to an SBM pattern 'language' (Lüdeke-Freund et al., 2019a). Figure 6.5 illustrates the idea of such a language by combining different patterns (words) to create more comprehensive business model designs (sentences or stories). Different patterns can embellish, integrate and support each other, which allows for the development of much richer business model designs. The ‘Differential Pricing’ example indicates how pattern combinations can lead to more complete and versatile business models that are better suited for implementing the above-discussed sustainability strategies and considering their complementsaries, but also their downsides and potential trade-offs. For example, improving the accessibility of medical treatments in developing countries may increase medical waste and create new risks to people and the environment. This downside, in turn, could be mitigated through take-back mechanisms. An SBM pattern language

| Table 6.1 | Exemplary pattern: Differential Pricing |
|-----------|----------------------------------------|
| Pattern name | Differential Pricing |
| Problem statement | Customers need a similar product but have different payment thresholds. Some customers are unable to pay as much as others for the same product. |
| Solution statement | Charging groups with higher payment thresholds higher prices to subsidize those groups who cannot afford to pay as much. |
| Context description and related patterns | Due to price barriers, low-income groups and customers at the ‘base of the pyramid’ are often excluded from consuming certain products and services. To address this, companies can increase their availability through Micro Distribution and Retail, make donations based on a Buy One, Give One pattern or involve low-income customers by Building a Marketplace. Typically, companies use Differential Pricing patterns to widen the spectrum of involved customer segments, that is, to grow their customer base, revenues and profits. From a sustainability perspective, the notion of growing a company’s customer base is about including neglected customer groups, for example, by offering basic services such as food and health care at lower prices. |
| Further explanations and examples | The majority of consumers in developed and developing countries spend a significant share of their income to satisfy essential needs, such as health and mobility. By adjusting the price of an offering with regard to what target groups can afford, Differential Pricing creates benefits for those who might otherwise be excluded from consumption. In developing countries, high costs of medicine and treatment are a barrier to accessing health care for low-income groups. Novo Nordisk has addressed this challenge by selling insulin in developing countries at prices that are up to 20% below the mean prices charged in Europe and elsewhere. Differential Pricing can be combined with Closing-the-Loop Patterns (e.g. Repair, Reuse or Take-Back Management) to offer discounts to customers who return used goods. |
| Further related patterns | |

Source: Based on Lüdeke-Freund et al., 2018a; 2019a.
A complete business model pattern that integrates other patterns and is supported by other patterns.

Business model patterns that integrate other patterns and add to another pattern.

Business model patterns that add to another pattern.

Source: Lüdeke-Freund et al., 2019a; Business Model Canvas based on Osterwalder and Pigneur, 2009.

**Figure 6.5** Illustration of connections between business model patterns
could thus be an effective approach to design more integrative and balanced business models for SSC.

5. Final remarks and outlook

The main ideas discussed in this chapter relate to the role of business models in supporting SSC, the consideration of major sustainability strategies and finally how SBM patterns can be a way of designing better business models for SSC. These ideas are meant to serve as a starting point for more comprehensive debates about how business models can support SSC, going beyond the often-heard calls for efficiency, consistency and sufficiency, which too often do not acknowledge that neither sustainability strategies nor business models unfold in a vacuum. Therefore, it is important to consider multiple sustainability strategies and business model design options at the same time – a complex but, as we think, worthwhile effort to create business models for a good life within the corridor of SSC. To support business model designers, an increasing number of tools is already available (see the review in Breuer et al., 2018). The aforementioned 45 SBM patterns can already be used online, together with an additional set of 25 patterns for circular economy business models (Lüdeke-Freund et al., 2018a; 2018b; Smart Business Modeler, 2019).

Coming back to the issues laid out in the introduction and the promises of using sustainability strategies and SBM patterns, some final remarks are necessary. All in all, each strategy and pattern has the (theoretical) potential of contributing to SSC, yet in different ways and, moreover, each approach is in itself limited and may even be a trigger for negative consequences in other places of our global, networked and highly complex production–consumption systems.

Efficiency gains may be overcompensated by increasing demand and economic growth (which does not mean that efficiency gains are unimportant, but that they are often not enough to achieve the required improvement). Consistency goes beyond incremental improvements and aims for ‘compatibility between the industrial and natural metabolism’ (Huber, 2000: 275), but as described above, faces problems, too. Together, these two strategies strive for a radical systems change, but merely from a technological perspective on resource use (McDonough and Braungart, 2013). Thus, to be sufficiently effective, also considering minimum standards of living as well as social limits to consumption, these strategies must be combined with approaches aiming for sufficiency and inclusion that will not concurrently reach the floor and crush the ceiling of the SSC corridor. Sufficiency strategies build upon values such as distributional justice and solidarity as well as the idea of a good life. Its full achievement, however, appears difficult in face of our economic and cultural realities and does not fully address questions of distributive justice. This blind spot is addressed by strategies for inclusion. As Huber remarked in 2000, to reveal their full strength, the introduced sustainability strategies must be discussed and applied as a set of interrelated, mutually reinforcing strategies, and the same holds for the different SBM patterns that are available today. Only if
applied in conjunction (‘smart design’) do they have the potential to contribute to a re-design of production and consumption practices for strong sustainability.

Yet, while there is potential for business to contribute to more inclusive access to consumption, for example, by designing SBMs that integrate multiple and well-balanced patterns, it is first and foremost a political issue at both the intra- and international level. Sustainability politics has not been considered in this chapter but is addressed in other chapters of this book (see Chapters 2 and 9). Moreover, achieving ‘eco-justice’ (Schaltegger and Burritt, 2005), that is, achieving social objectives while remaining within ecological limits, requires free and distributable ecological capacities in the first place. The ongoing negotiations about national commitments to combat climate change reveal how difficult this is.

NOTE
1 For more details on the SBM patterns and groups, see Lüdeke-Freund et al. (2018a; 2019b).

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