

Chapter 2

Developing a Sustainable Supply Chain Strategy

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Learning Goals.

By reading this chapter you will:

- Know the basics of competitive strategy and supply chain strategy and understand their interrelations
- Understand the need for a sustainable supply chain strategy
- Understand the ingredients of a sustainable supply chain strategy
- Apply a generic, iterative approach to develop your sustainable supply chain strategy
- Apply a balanced scorecard to implement your sustainable supply chain strategy

2.1 Introduction: The Starting Point

Long-term trends pose challenges for supply chain managers and make increasing requirements on the strategic management expertise of today's companies. These trends include ongoing globalisation and the increasing intensity of competition, the growing demands of security, environmental protection and resource scarcity and, last but not least, the need for reliable, flexible and cost-efficient business systems capable of supporting customer differentiation. More than ever, modern supply chain managers are confronted with dynamic and complex supply chains and therefore with trends and developments that are hard to predict.

In years to come, supply chain management will therefore take on additional strategic tasks that extend beyond its current more operational scope of activity. In order to respond to these changes and remain competitive, supply chain managers need to be able to identify and understand new sustainability issues in their company and business environment.

This calls, especially in respect of global, international, and fragmented supply chains, not only for highly efficient supply chain operations, but also for networking skills that must continuously adapt to sustainability demands to create sustainable,

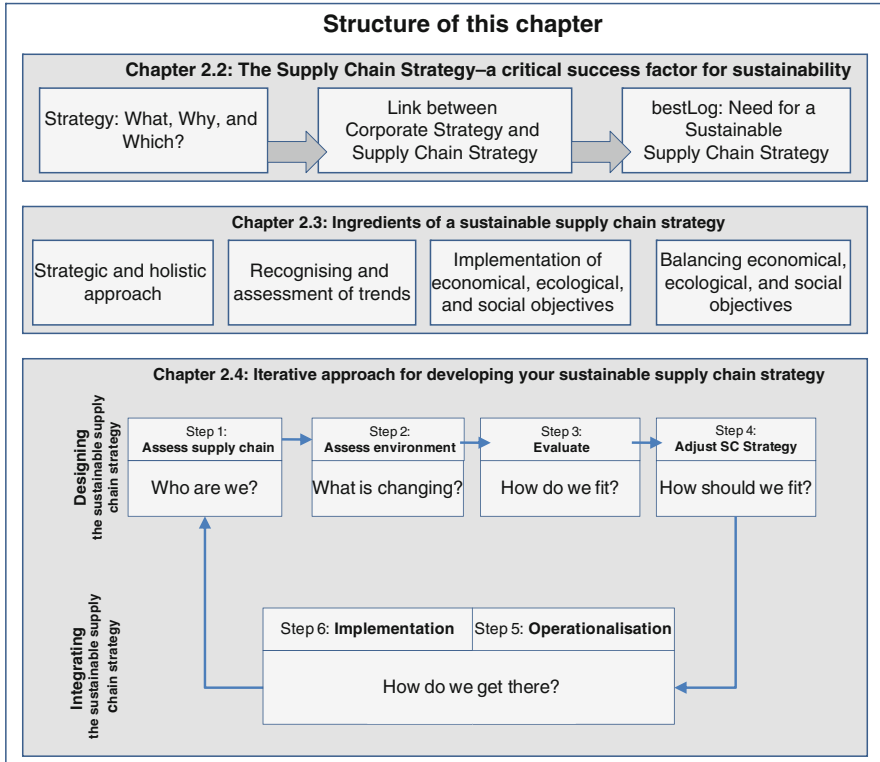


Fig. 2.1 Structure of this chapter

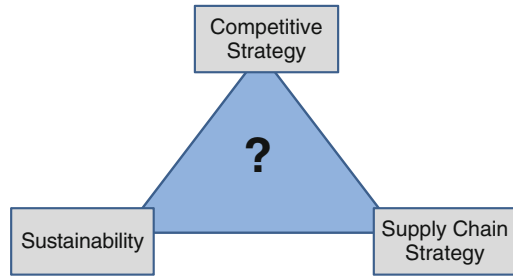
long-term customer-focused supply chains. It calls for the development of sustainable supply chain strategies which create a sustainable competitive advantage.

We will focus in this chapter on how to develop a supply chain strategy for sustainability, and on how to integrate it into your existing supply chain. Section 2.2 introduces the basics of competitive strategy and supply chain strategy, the relationship between the two, and finally, their links with sustainability. Section 2.3 describes the main ingredients of a sustainable supply chain strategy identified in the course of the bestLog project research. Section 2.4 describes a generic, iterative six-step approach to developing and implementing a sustainable supply chain strategy. The following figure illustrates the structure of this chapter (Fig. 2.1).

2.2 The Supply Chain Strategy: A Critical Success Factor for Sustainability

We mentioned earlier the necessity for strategic management in today’s supply chains. We will now briefly address the following questions: What does a competitive corporate strategy involve? What is a supply chain strategy, and how is it linked

Fig. 2.2 Three areas to integrate



to the competitive strategy? And where is the link to sustainability? Figure 2.2 shows the three areas and their links, which we will try to understand in this section.

The word “strategy” derives from the ancient Greek “strategós” which in turn derives from two words: “stratos” (army) and “ago” (leading). Today’s definition of competitive strategy is a holistic, long-term plan for a company¹ to find a distinctive way of competing in order to guarantee profitability over a limited time span, considering the development of its business environment. A competitive strategy is specified by a bundle of aims and objectives to establish a *competitive advantage*,² which allows the company to outperform others in the same industry or market. One indicator for this outperforming capability is the company’s profitability, compared to the industry average.

According to Porter, there are two basic types of *competitive advantage* a company may pursue: low cost, or differentiation. Porter combines these with the scope of activities that a company seeks to pursue and derives three generic strategies for achieving excellence and market success: cost leadership, differentiation, and focus. The focus strategy has two variants, cost focus and differentiation focus.³

In cost leadership, a company aims to become the lowest cost producer in its industry. The sources of cost advantage vary between industries. Usually they include economies of scale, proprietary technology, and preferential access to raw materials.⁴ With a differentiation strategy, a company seeks to develop products and services that are perceived as unique in its industry, and which create a value advantage for its customers. This emphasizes the importance of focusing on one or more attributes that customers perceive as important, which usually leads to higher cost levels. But customers of these strongly differentiated companies are loyal to its

¹Strategy in diversified companies is many-faceted and may be defined at business unit or corporate or company-wide levels. Competitive strategy seeks to create competitive advantage in each of the fields in which a company competes. Corporate strategy concerns two different questions: what business the corporation should be in, and how the corporation should manage an array of business units. See Porter (1987).

²Porter (1985).

³Porter (1985).

⁴Porter (2008), p. 11.

services and products, are less price-sensitive, and reward the effort made by paying premium prices.

In general we can distinguish – following markets and competition theory – three decisive factors which determine the business environment and consequently the strategy of a corporation: Demand (e.g. customers, target groups, etc.); Supply (e.g. competitors, employees, suppliers, etc.); and the General Environment (e.g. regulations, society, natural resources, etc.). In today's business environment all these three factors are becoming increasingly complex, are changing over time, and together determine the behaviour of market players. Hence a great challenge for strategists is to satisfy on the one hand shareholders, and on the other hand more and more other stakeholders; especially with regard to the latest developments involving sustainability, where certain stakeholders like interest groups for CSR or environmental protection (e.g. Greenpeace) are becoming more and more powerful.

A company's supply chain now plays an important part in the aforementioned three decisive factors and therefore represents an essential strategic resource in the achievement of the strategic goals. For example, customers increasingly recognise the value of supply chain service and quality and are less likely to select products and services only on price. Companies like Apple, Dell, and Procter & Gamble, for example, increasingly outperform others in supply chain excellence.⁵ It is now recognised that not only companies but rather, whole supply chains, are in competition.

Both in theory and practice, we find two basic supply chain types, having the potential to assist competitive strategy in the achievement of both cost leadership and differentiation strategy: Lean, cost, efficiency-driven supply chains, and in contrast agile, fast, service driven supply chains.⁶

A lean supply chain fits well with a cost leadership strategy, and is particularly successful, if total logistics costs represent a high proportion of the cost of goods sold, and if the supply chain offers sufficient possibilities for reducing and controlling these costs. An agile supply chain strategy fits well with a differentiation strategy, particularly if customer-oriented differentiation is essential and supply chain solutions need to be segmented and diversified.

Best practice companies do not focus on just one, fixed supply chain strategy. There is an increasing need – and competitive advantage follows – to customise supply chains individually (with regard to different customers, countries, and products) and in consequence to implement multiple supply chain strategies and solutions; especially where quite heterogeneous customer-product mixes need to be supported within the same global supply chains.

The strategic challenge for a supply chain manager is to configure and develop holistically all the multi-layered fields of a supply chain aiming as a whole a strong alignment with the competitive and corporate strategy. The “bridge” from corporate

⁵O'Marah and Hofman (2010).

⁶Christopher (2005), Chopra and Meindl (2004) and Fisher (1997).

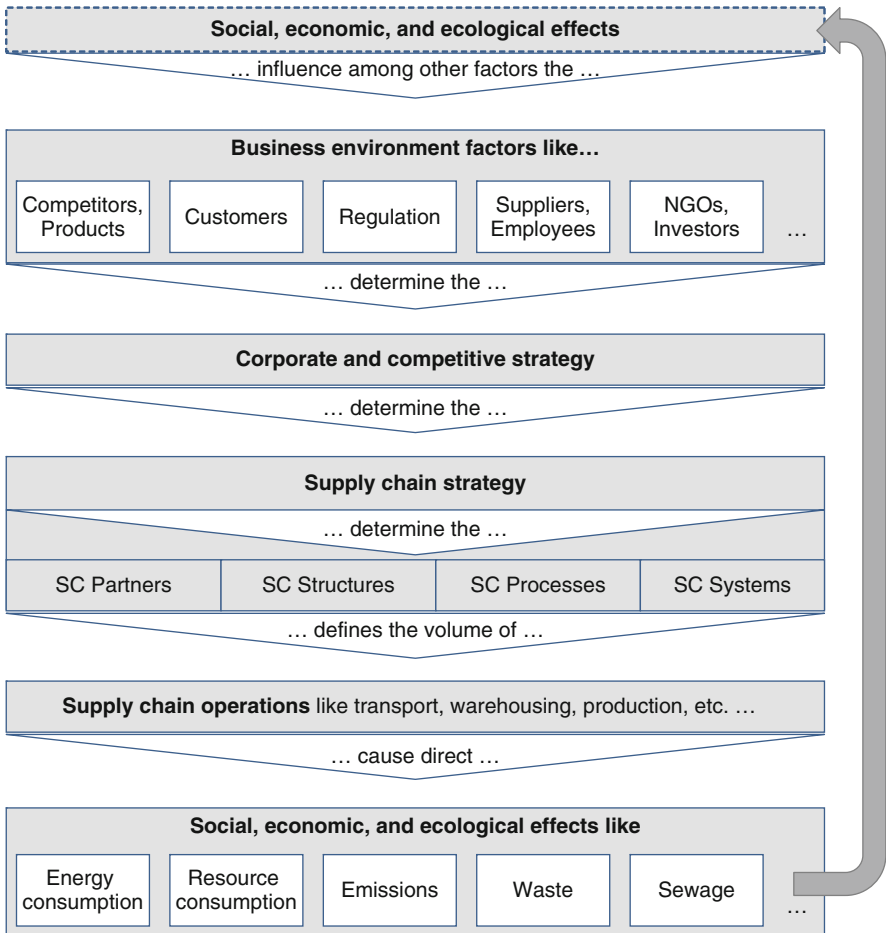


Fig. 2.3 Supply chain strategy as a bridge between competitive strategy and sustainability

and competitive strategy to supply chain types is the supply chain Strategy. The supply chain Strategy determines the goals and the configuration of the supply chain with regard to supply chain partners, structures, processes, and systems (see Fig. 2.3). In detail these are:

- Regarding the supply chain partners e.g. selection of partners, configuration of outsourcing models and associated gain and cost sharing models
- Regarding the supply chain structures – e.g. configuration of distribution or production network structures in terms of vertical and horizontal stratification
- Regarding the supply chain processes – e.g. configuration of procurement, production, and distribution processes with regard to costs, reliability, speed, and flexibility

- Regarding the supply chain systems – e.g. configuration of leadership, information, reporting, controlling, and incentive systems

In accordance to the aforementioned three decisive factors which determine the strategy of a company, the criteria involved in developing the “right” supply chain strategy are often – both in theory and practice – “demand” or “supply” characteristics of the supply chain. Let’s have a look on some well-known concepts. For example, Christopher develops the following matrix of possible supply chain strategies by specifying “supply” characteristics according to the “lead time of replenishment”, and “demand” characteristics by the “demand forecast” of the products (see Fig. 2.4). As a further example, Chopra and Meindl derive the supply chain strategy through specifying “demand” characteristics by the “demand uncertainty” along the whole supply chain (see Fig. 2.5).⁷ As a last example, Fisher specifies the “supply” and “demand” characteristics with the following product aspects: the product life cycle, demand predictability, product variety, and market standards for lead times and service. Accordingly, Fisher identifies two categories: products that are either primarily functional, or primarily innovative. Fisher argues that each of these product categories requires a distinctly different kind of supply chain: “Functional products require an efficient process; innovative products, a responsive process.”⁸ (See Table 2.1).

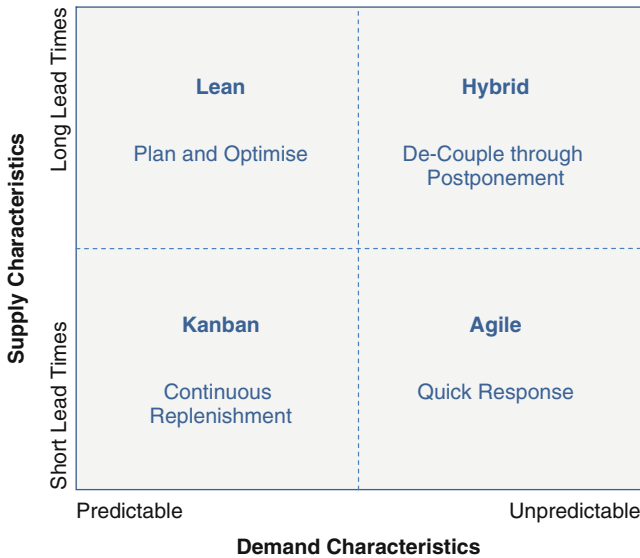


Fig. 2.4 Matrix of generic supply chain strategies (Christopher 2005)

⁷Chopra (2004), p. 3.

⁸Fisher (1997), p. 109.

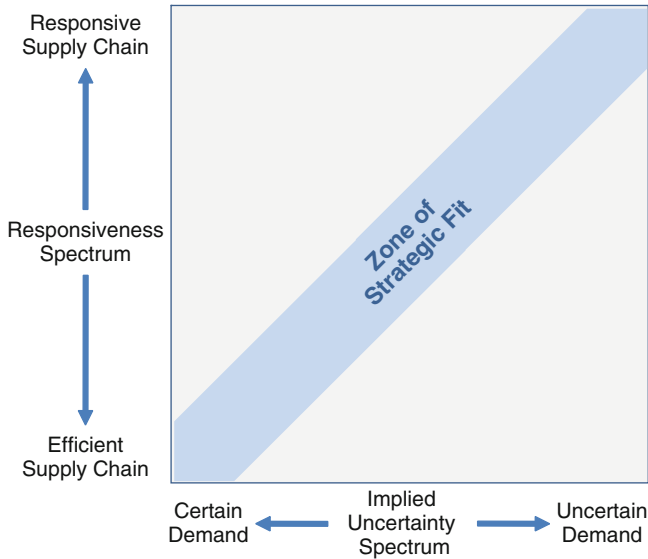


Fig. 2.5 Finding the zone of strategic fit (Chopra 2004)

Having considered these concepts and further discussions with practitioners, bestLog reveals that today’s supply chain strategies concentrate more on “supply” and “demand” characteristics rather than on supply chain external conditions, such as social, technological, environmental, and political conditions. And this is a main reason why today’s supply chains misjudge the relevance of sustainability in their strategies, although the link to sustainability is immense. As suggested in Fig. 2.3, the type of supply chain and its strategic configuration determine the “volume” and the “quantities” of supply chain operations such as transport, warehousing, production, and recycling. A simple example: a European distribution network consisting of one central warehouse combined with air freight has a different operations volume from a network consisting of seven regional warehouses combined with rail and road freight. Therefore, the social, economical, and energy and resource consumption levels will distinctly differ, in turn influencing efficiency and cost aspects. Further differences will be seen in the CO₂ emissions of the trucks and planes, or in packaging waste in the warehouses.

And this is the main point here. The supply chain, as a key to competitive advantage in many companies, significantly determines the social, economic and environmental impacts of your company, which in turn influence more and more of your stakeholders and shareholders. Hence a *sustainable* supply chain strategy – representing one of the most important success factors for achieving sustainable development for your company–must exhibit the following characteristics:

- It is aligned to the underlying corporate and competitive strategy
- It considers demand, supply, and in particular other, wider general conditions

Table 2.1 Functional versus innovative products: physically efficient versus market-responsive supply chains (Fisher 1997)

	Functional (predictable demand)	Innovative (unpredictable demand)
<i>Aspects of demand</i>		
Product life cycle	More than 2 years	3 months to 1 year
Contribution margin ^a	5–20%	20–60%
Product variety	Low (10–20 variants per category)	High (often millions of variants per category)
Average margin of error in the forecast at the time production is committed	10%	40–100%
Average stockout rate	1–2%	10–40%
Average forced end-of-season markdown as percentage of full price	0%	10–25%
Lead time required for made-to-order products	6 months to 1 year	1 day to 2 weeks
	Physically efficient process	Market-responsive process
Primary purpose	Supply predictable demand efficiently of the lowest possible cost	Respond quickly to unpredictable demand in order to minimize stockouts, forced markdowns, and obsolete inventory
Manufacturing focus	Maintain high average utilization rate	Deploy excess buffer capacity
Inventory strategy	Generate high turns and minimize inventory throughout the chain	Deploy significant buffer stocks of parts or finished goods
Lead-time focus	Shorten lead time as long as it doesn't increase cost	Invest aggressively in ways to reduce lead time
Approach to choosing suppliers	select primarily for cost and quality	Select primarily for speed, flexibility, and quality
Product-design strategy	Maximize performance and minimize cost	Use modular design in order to postpone product differentiation for as long as possible

^aThe contribution margin equals price minus variable cost divided by price and is expressed as a percentage

- It incorporates environmental, social, and economic perspectives in all proposed actions
- It builds increased shareholder and stakeholder value, especially customer satisfaction

A supply chain strategy exhibiting these characteristics is sustainable and represents the starting point of best practice companies to adapt their enablers for managing internals (see Chap. 4), managing externals (see Chap. 5), to adapt their performance measurement system (see Chap. 3), and to adapt their risk management (see Chap. 6). We will now look at the key ingredients of a sustainable supply chain strategy, which we have derived from our bestLog research.

2.3 Ingredients of a Sustainable Supply Chain Strategy

From our countless discussions with hands-on practitioners, industry experts, trade association representatives, academics, and politicians, which we conducted in dedicated workshops, via the bestLog online platform and in case study interviews in the course of the bestLog project, we have identified the distinctive ingredients of a sustainable supply chain strategy – defined in the previous section. The following gives an overview of these ingredients.

2.3.1 *Ingredient I: A Strategic and Holistic Approach*

The bestLog research shows clearly that today’s sustainable practices, balancing environmental, economical, and social goals:

- Are extremely varied and arbitrary
- In large corporations, are often implemented as “island solutions” by individual business units and often with a regional or specific customer scope
- Often lead to solutions which seem to be sustainable at first glance if you look only at the particular company, but not for the total supply chain, where suppliers or service providers are set unbalanced objectives.

These failings, we have found, are due to the absence of:

- Specific sustainability goals in the corporate vision and strategy
- Specific sustainability goals in the supply chain strategy
- End-to-end responsibility of responsible logistics and supply chain managers
- Implementation experience and shared knowledge and
- Top management commitment

Logistics and supply chain managers are often mainly focused on measures that appear to lie within their natural scope of responsibility. They have often implemented environmental and social policies as a kind of aside; often without integrating them with the economic dimension. Sometimes to a greater and sometimes to a lesser degree, they have not really viewed or addressed economic, environmental or social responsibility issues holistically.

Define Sustainability As a Strategic Issue and Be Concrete Best practice companies show different characteristics: Sustainability is a strategic issue and is given top management commitment, with responsibility for sustainability being assigned to management at board level. Sustainability is integrated in the corporate policy and strategy in the form of guiding principles and visions. Based on a top-down approach, sustainability is rooted in the supply chain strategy and sustainability goals are defined in concrete supply chain KPI systems.

Case:**INDITEX Pro-Kyoto Project**

INDITEX is developing a Strategic Environmental Plan 2007–2010 at top management level which is divided into five specific projects; one related to logistics.

(See Case Collection in Part IV of this book)

Enhance Learning and Transfer Knowledge from Existing Good and Especially “Worse” Practices Our bestLog research showed that especially large and global corporations lack transparency concerning their designed, planned, and implemented sustainability practices. As mentioned, many practices in such companies are developed by individual business units, and often with a regional or specific customer scope.

In contrast, best practice companies show transparency regarding all designed, planned, and implemented sustainability practices, even along their end-to-end supply chains. They are able to use this information to understand their specific customer and market needs as well as the changing business environment.

Best practice companies do not only focus on successful or best practices. Learnings from failed or “worse” cases can be as valuable as good or best practices, or more so. The bestLog transferability research reveals that sustainable practices have many generic similarities and allow cross-functional learnings, hence can cross organisational classifications and boundaries, e.g. business units, during the knowledge collection and learning phase.

Broaden the Responsibility of Your Supply Chain Managers Supply chain managers in best practice companies are involved in the early stages of product development and product design. Challenges tackled during the product development process rarely concern logistics, on the other hand changes in product development are sometimes very small, but may have a big impact on logistics efficiency and finally, on eco-efficiency. How effective such “simple” things can be is shown in the IKEA case study.

BestLog research showed that best practice companies emphasise intra-organisational communication and enlarge the sphere of responsibility of their supply chain managers.

Case:**IKEA – Air Hunting Competition**

It is interesting to see that a single person at IKEA is entirely responsible for the Tealight product supply chain. The so-called “Need Planner” has full transparency along the whole end-to-end supply chain. This enabled this individual to explore new efficiency potentials regarding the product’s packaging and “simple” product re-design.

(See Case Collection in Part IV of this book)

Establish a Dedicated Organisation, Train and Motivate People New sustainability initiatives and projects along the supply chain may have a broad impact on several operations, within and beyond individual companies. This may cause additional complexity and more intra- and inter-company trade-offs, especially due to knowledge being dispersed along the supply chain. Our research shows that in consequence some large best practice companies have extended the scope of their existing health, safety and environmental protection (HSE) organisations to encompass supply chain management issues. The role of such a separate, centralised, cross-functional, organisation for sustainability is to:

- (a) Report to top management
- (b) Consolidate issues and support implementation projects
- (c) Provide advice
- (d) Collect and disseminate learning and best practice
- (e) Represent a single point of contact for external entities and supply chain partners
- (f) Organise and coordinate training
- (g) Consolidate R&D activities

Another role of this organisation is to train personnel and to develop tools and instruments for their day-to-day, as the implementation process for sustainability goals is the key to winning acceptance and achieving *durable* sustainability solutions. The effectiveness of training and implementation tools can be enhanced by an incentive system. Incentives behind sustainable solutions can be monetary, but may also recognize achievements with awards or certificates. Monetary rewards can be linked to cost savings.

Sustainability is an Opportunity. Invest in R&D Depending on your industry's structure, you may need to push for R&D activities with regard to sustainability. One reason may be a business's high dependency on natural resources; this applies in particular to Logistics Service Providers (LSP). Natural resources are becoming increasingly scarce and expensive. This, together with the massive demographic changes afoot worldwide (population growth, urbanization) leads to huge opportunities, but also serious risks.

The bestLog research shows that best practice companies integrate sustainability with their R&D activities, focus on broader challenges, are on the whole optimistic, and see environmental issues as providing an opportunity to reduce costs in the supply chain and to open up new markets by developing environment-friendly products and services.

Create Values, Knowledge, and Culture with the Right People and the Right Image The bestLog research showed that good concepts behind best practice have often been developed from simple ideas by the people directly responsible. The key lever to implement a sustainable supply chain with a common vision and culture is the people, the actors who make the decisions in the supply chain. The values, awareness, and the mindsets of the people in your supply chain are fundamental in determining your sustainability results. Development begins with the selection of your supply chain partners and your employees.

In this context, the bestLog research shows that best practice companies put strong emphasis on sustainability at executive and senior management level, as sustainability values are generally transferred top-down to employees.

Another, associated finding was that best practice companies merge sustainability with their general company image. One reason: employees tend to work in line with the overall corporate image, which is communicated internally as well as externally. A good example is “Quality Thinking” at Mercedes-Benz, a slogan which is strongly communicated by the company since its foundation, and firmly anchored in the behaviour of its employees.

My belief is that a strong corporate culture with an explicit value system will (in the long run) lead employees who do not follow these values to leave the company. And those who do voluntarily espouse the corporate values will transfer these values along the supply chain, and will assess their supply chain partners based on this value system. A strong sustainability culture at company level will be transferred across the whole supply chain – assuming the company concerned is the dominant partner in the supply chain.

The bestLog research also indicates that best practice companies emphasise the creation of sustainability knowledge and the implementation of practical tools. Training and education play key roles. Focus on specific training topics is used to establish the value system. The organisation’s vision and its values are incorporated within concrete competencies, actions, and instruments.

2.3.2 Ingredient II: Recognizing and Assessing Current and Future Trends

Over-arching macroeconomic and social trends,⁹ globalisation and increasing competition, longer and more fragmented supply chains, and increasing stakeholder and shareholder demands, all affect the complexity and dynamics of supply chains. More than ever, today’s supply chain managers are confronted with dynamic and discontinuous change (e.g. oil prices), and the more dynamic they are, the harder trends are to forecast. Longer and increasingly fragmented value chains, together with totally new dimensions of objectives (e.g. CO₂ emissions reduction), extend the responsibilities and agendas of today’s supply chain managers.

Future-oriented sustainable strategies must be able to adapt to nascent trends as early as possible, and logistics goals must be geared towards these trends. This is

⁹Changes in the business environment occur usually as trends. Trends in a business environment are changes which take place over time and affect companies in their competitive environment; for example, the current “corporate social responsibility” trend or the “green SCM” trend. Some such trends – so-called “mega trends” – have a more global and extended impact on the economic, business, and social environment. Climate change is an example of such a mega trend: It affects customers, regulations, society, the competition, investors, and the markets of a company.

key to ensuring the long-term success of a company. The challenges for supply chain managers in this context are (a) to identify the trends which are relevant to their complete supply chain and (b) to assess and evaluate their potential negative and positive impacts.

“Scenario-Planning”: Bring Supply Chain Managers and Stakeholder Executives into the Process Early “Scenario planning” is a traditional tool to plan and develop different paths (=sequences of different scenarios) for your business with regard to trends. Scenario planning is now a standard tool in companies and is often applied successfully, due to its simplicity. The bestLog research shows that today’s uncertainties complicate scenario planning efforts: the number of variables at play – and the range of plausible outcomes – have exploded in recent years, especially in the context of global supply chains. Different outcomes for each of the supply chain uncertainties may produce very different paths for the business.

Best practices companies manage this challenge differently: their supply chain strategists apply a demanding process of gathering information and exploring possibilities. Best practice companies bring supply chain managers along the supply chain and stakeholder representatives into the planning process early. This inclusive approach inculcates an appreciation of the threats the supply chain faces and leads to a collective strategic response.

Be Aware of Uncertainty Regarding Sustainability Issues in Your Supply Chain The bestLog research shows that best practice companies recognise trends in their business environment earlier than their competitors, and are better able to assess their possible impact. Hence, best practice companies embark on critical action, requiring long lead times, earlier; e.g. early investments in given technologies, the development of strategic partnerships, or the development of innovative products or services.

Furthermore, best practice companies monitor trends in a systematic and holistic manner, using indicator systems to observe and analyse all potential developments in their business environment. Best practice companies are able to solve the associated technical, structural, and organisational issues, a capacity especially relevant to global supply chains. And again, a key success factor in their supply chains is their broad, end-to-end responsibilities.

Understand Cause–Effect Relations Between Trends and Your Supply Chain The early identification of trends is one thing: the next challenge is to assess the potential impacts of those trends on your supply chain. Here are some examples of quite difficult questions which best practice companies were able to answer in our interviews: What is the total cost effect for your supply chain if the oil price doubles? What oil price justifies structural change in your supply chain, e.g. regionalisation? How far could the CO₂ emissions of your supply chain be reduced compared to your company-wide CO₂ emissions? How much has your practice reduced your external costs? We have seen that best practice companies try hard to understand the complex cause-and-effect relations between uncertain trends and their supply chains.

Case:**Mercadona and Renfe Collaboration on Intermodal Distribution**

Mercadona has achieved an external costs saving of € 13.1 million.

(See Case Collection in Part IV of this book)

2.3.3 Ingredient III: Implementation of Economic, Environmental, and Social Objectives

Implementation – integrating objectives into operations – plays an important role in the adaptation of supply chains to “new” supply chain objectives such as environmental or social goals. Implementation is, put simply, the “translation” of strategic, partly generic, long-term goals into operational, specific, short-term goals. One result of an implementation process is usually a group of interrelated KPIs, also called a “KPI system”. Such a KPI system is a kind of “quantitative tool” used to implement strategic goals into company operations. Of course there are, besides a quantitative “tool”, also pretty important qualitative aspects influencing a strategy implementation, e.g. good communication, high motivation, the right awareness, etc. We will resume these aspects in the next section.

The challenge for supply chain managers is to “break down” the strategic goals into the “right” KPIs and to define the specific target figures for a given reporting period. The challenge in selecting the “right” KPIs is, of course, to select those KPIs which measure and control the right operational processes. Another challenge is that different operational goals may be complementary, or may conflict with each other; a KPI system must take potential trade-offs into account.

Environmental and social goals in particular are in most cases new to many operations, and need to be integrated into their existing KPI system. One recent study on trends and strategies in logistics showed that 43% of large companies and only 26% of SMEs had defined concrete environmental and resource protection goals among their logistics operations’ targets.¹⁰ One reason is a lack of knowledge regarding the measurement and the assessment of environmental and social impact KPIs.

Develop KPI Systems Taking into Account New Kinds of Goal and Related Trade-Offs The bestLog research shows that best practice companies tend to have the capability to translate new strategic goals¹¹ into the operations via an adaptive and intelligent KPI system. Such KPI systems consider trade-offs and complementarities between social, environmental, and economic goals.¹² One success factor is the strong top management commitment to these goals. Another

¹⁰Straube and Pfohl (2008), p. 69.

¹¹New also in terms of the dimension considered; social and environmental goals within a supply chain strategy are in many companies new, or at least secondary.

¹²We will return to the topic of “measurement” and KPI systems again in Chap. 3.

success factor is that the supply chain managers of best practice companies are able to describe cause-and-effect relations in their supply chain with regard to social, economic, and environmental issues.

2.3.4 Cash Flow Matters: Link Social and Ecologic Goals with Financial Figures

A green strategy or a social strategy is not a strategy for sustainability. True sustainability must give equal weight to the economic dimension. Sustainable supply chain practices must be financed and provide pay back within a reasonable time span. In bestLog we have seen logistics practices which were abandoned during the economic crisis in 2008 due to their economic disadvantages. An example was Mercadona's intermodal transport practice in Spain, which caused clear negative cash flow, having not reached critical transport mass.

The challenge is to assess the economic, in particular financial, aspect of a practice. Best practice companies are capable of this. They have extended their supply chain KPI systems to include social and environmental measures and can link this whole operational KPI system with their financial measurement systems. The Sustainable Supply Chain (SSC-)Scorecard in Sect. 2.4 will provide a generic template to apply this approach in your company.

2.3.5 Ingredient IV: Balancing Economic, Environmental, and Social Objectives

Part I has shown the general relevance and importance of balancing social, environmental and economic objectives in companies' sustainable development. The central challenge here is that balancing economic, environmental and social objectives requires first of all an understanding of the conflicting and complementary relationships between them. The strategic challenge is then to establish realistic and balanced targets in different operations in all three dimensions. And each of the three dimensions must be aligned to the overall corporate strategic goals and vision, regardless of possible specific trade-offs.

Provide Incentives and Motivate People The bestLog research shows that best practice companies fulfil a necessary condition of implementing balanced goals in an organisation: they provide incentives and motivate the people involved in order to change their attitudes and to redirect their business systems towards these balanced goals.

So a sustainable supply chain strategy must rethink existing intra- and inter-company incentive systems in order to tackle unbalanced objectives. An important strategic question which we discussed several times in bestLog was: Do

the current business models applied by supply chain partners motivate and reward a balance of sustainability goals? The answer was quite clear: not in the majority; supply chain managers are usually driven by traditional cost- and service related measures. Achieving social and environmental objectives, although they might be complementary to other objectives, is in most cases not directly rewarded.

Case: IKEA – Air Hunting Competition

The interesting learning of this case is that IKEA started an internal competition motivating all people to find highest amount of air in their transport processes. The competition itself was a highly motivating factor.

(See Case Collection in Part IV of this book)

Make People Aware of the Long-Term Benefits Further, the bestLog research revealed that making people aware of the long-term benefits of change and implementing best practice into day-to-day work is an important strategic challenge, addressing different strategic management levers such as branding, communication, culture, knowledge management, knowledge development, trust and collaboration, as well as the transparency of cause-and-effect relations.

The next section takes these challenges and ingredients of success, and describes a general, iterative approach with a number of tools and frameworks to support you in the development of your sustainable supply chain strategy.

2.4 An Iterative Approach to Developing Your Sustainable Supply Chain Strategy

The ingredients of a sustainable strategy were identified in our bestLog project research. The following describes briefly an iterative six-step process approach to integrating these principles into your existing supply chain.

A sustainable supply chain involves more than the implementation of popular practices – most of them are just building blocks. Rather, individual practices must be assembled to integrate meaningful long-term sustainability principles, along the end-to-end supply chain. A systematic approach to strategy design and integration can help companies developing a sustainable supply chain to create a value proposition.

The following five questions define the road map to a sustainable supply chain (see Fig. 2.6), helping to change or redesign your current supply chain strategy. The action plan will be derived from the risks and opportunities your supply chain faces in the present business environment, and will face in future. The approach ends with a Sustainable Supply Chain (SSC-)Scorecard, which serves aid in the implementation of a strategy for sustainability into your existing supply chain.

This iterative six-step approach has to be seen as a cycle which should be executed regularly in your supply chain, since relevant conditions may change quite quickly and sometimes radically – see, for example, the oil price spike of 2008.

Step 1 aims to take stock of the current state of company- and supply chain-specific characteristics regarding strategy, resources, and current and planned practices. It is mainly concerned with internal factors and considers elements which are usually within the control of a company. Step 2 aims to identify current and forecast potential future developments and trends, focusing on external factors influencing the supply chain. It considers factors which are usually not under the direct influence of a company. Step 3 aims to evaluate the risks and opportunities derived from these internal and external factors. It serves to define company- and supply chain-specific “sensitivity”. Step 4 takes this analysis to the existing supply chain strategy, and institutes a strategy change or redesign process with regard to the sensitivity identified. Step 5 focuses on implementation issues in order to balance social, economic, and environmental objectives, with the aid of a novel Sustainable Supply Chain Scorecard concept. Step 6 focuses on the key ingredients required to successfully implement the sustainable supply chain strategy in the relevant organisations.

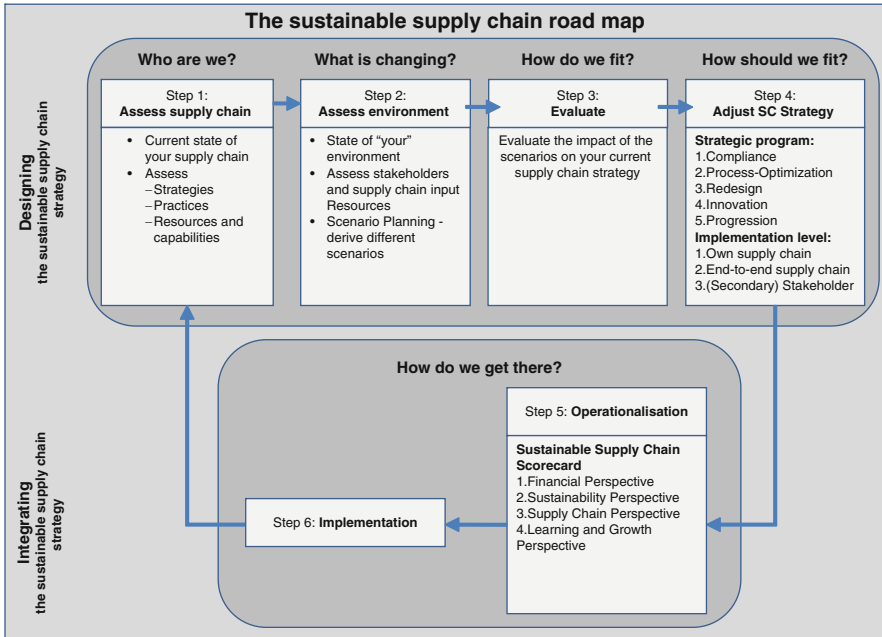


Fig. 2.6 Towards a sustainable supply chain strategy – from principles to practice

2.4.1 Step 1. Stocktaking: The Current State of Your Supply Chain

The “as-is” analysis in this step 1 is focused on the strategies, the sustainability practices and the associated resources and capabilities in your supply chain. The assessment of these attributes will help later in step 3 to identify the risks and opportunities you are facing, and to derive the appropriate extension or re-design of your existing supply chain strategy in step 4.

Strategies. Aiming to match the strategic and holistic approach of best practice companies (see Sect. 2.3.1) requires an understanding of the existing strategies and the associated strategic goals within your own company and along your supply chain. The integration of a sustainable supply chain strategy is usually not a greenfield development, and will most likely not lead to a complete re-engineering of your supply chain and strategy. Rather, step-by-step adaptation is preferable, unless your company and its supply chain are urgently threatened by the changing business environment.

So, take stock of:

- The existing corporate and competitive strategies
- The sustainability strategies (if sustainability is not already part of the corporate strategy)
- The company-specific supply chain strategies, and finally
- The cross-company supply chain and collaboration strategy¹³.

A simple result of such a strategy review is shown in the following illustration (Fig. 2.7). Examples of those basic strategy types are listed in the following table. We will not focus here on any one of them – please see the “Bibliography” section for more information about them (Table 2.2). The most important result of such an

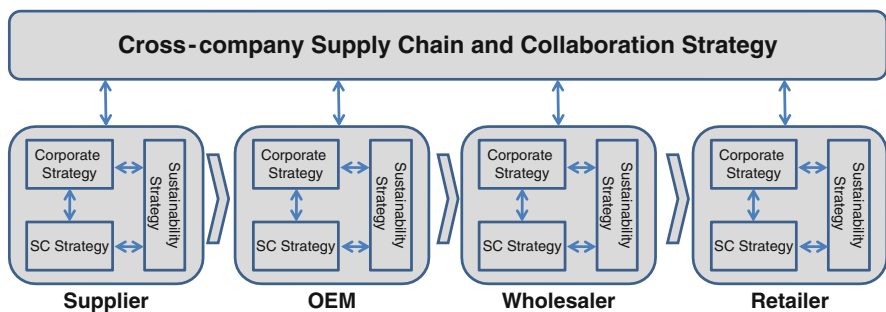


Fig. 2.7 Strategies along a simple supply chain

¹³For the sake of completeness we should mention that the company-specific supply chain strategy of many OEMs determines substantially the cross-company supply chain strategy of the whole supply chain.

Table 2.2 Strategies along a simple supply chain

Strategy level	Strategy type	Strategy type
Competitive strategy	Cost leader	Differentiation strategy
Supply chain strategy	Lean, cost- and efficiency driven	Agile, service- and speed-driven
Cross-company collaboration strategy	Hierarchical control	Heterarchical control
	Long-term partnership	Short-term partnership
	Horizontally integrated networks	Vertically integrated networks
Company's own sustainability strategy	Defensive	Offensive

analysis of the *status quo* is the understanding of potential intra- and inter-organisational goal conflicts. It seeks to discover whether there is a common strategic alignment, and whether the goals of each strategy element are integrated, aligned, and complementary. A company's own supply chain strategy which is not aligned to the corporate and cross-company supply chain strategy cannot per se be sustainable.

Potential short- and long-term goal conflicts can rapidly become serious barriers to implementing a sustainable supply chain along its members; especially if the supply chain is required to adapt quickly to change.

The analysis will also show if top management commitment is given within the individual companies and the supply chain. The section on the Ingredients of a Sustainable Supply Chain Strategy showed that the lack of top management commitment is the most common cause of "island" solutions.

A holistic understanding of the existing business models and their goal relations in such a system will also allow a better balancing of economic, environmental and social objectives, which may also result in a change of existing business models between supply chain partners.

Practices, Resources, and Capabilities. With regard to best practice companies your stocktaking analysis should also serve to increase transparency, revealing existing, planned, and failed sustainability practices; particularly along the end-to-end supply chain. This allows you to understand on the one hand the trends in your supply chain regarding your customers' requirements and the market's needs, and on the other, to see where skills and resources may be lacking.

Step one ends with an "as-is" analysis of the current state of company- and supply chain-specific characteristics. The next step aims to identify current and forecast potential future developments and trends emerging from external factors influencing the supply chain. It is an external view, and considers aspects which are usually not under the direct influence of a company.

2.4.2 Step 2. Your Environment: Current, Potential, and Future Impact Factors

The second step in our approach is linked to Ingredient II and deals primarily with what is changing in the business environment, what kind of scenarios your company will face in the medium and long term, and finally, what the main driver of change

may be. This will lead, together with the “as-is” analysis from step 1, to the definition of potential risks and opportunities for your supply chain strategy in step 3.

The most important topics to be considered in this step are supply chain input resources, such as fuel and energy, stakeholders, and shareholders.¹⁴ We have devoted a separate chapter to the topic of supply chain stakeholder management, in recognition of its relevance to sustainable supply chain management.¹⁵ The key task – details will be discussed in this later chapter – is to identify the “right” stakeholders and their “stakes” in your supply chain in order to get a precise assessment of their risk and opportunity factors for your supply chain – now and in future. The potential stakeholders in a supply chain are shown on the following illustration (Fig. 2.8).

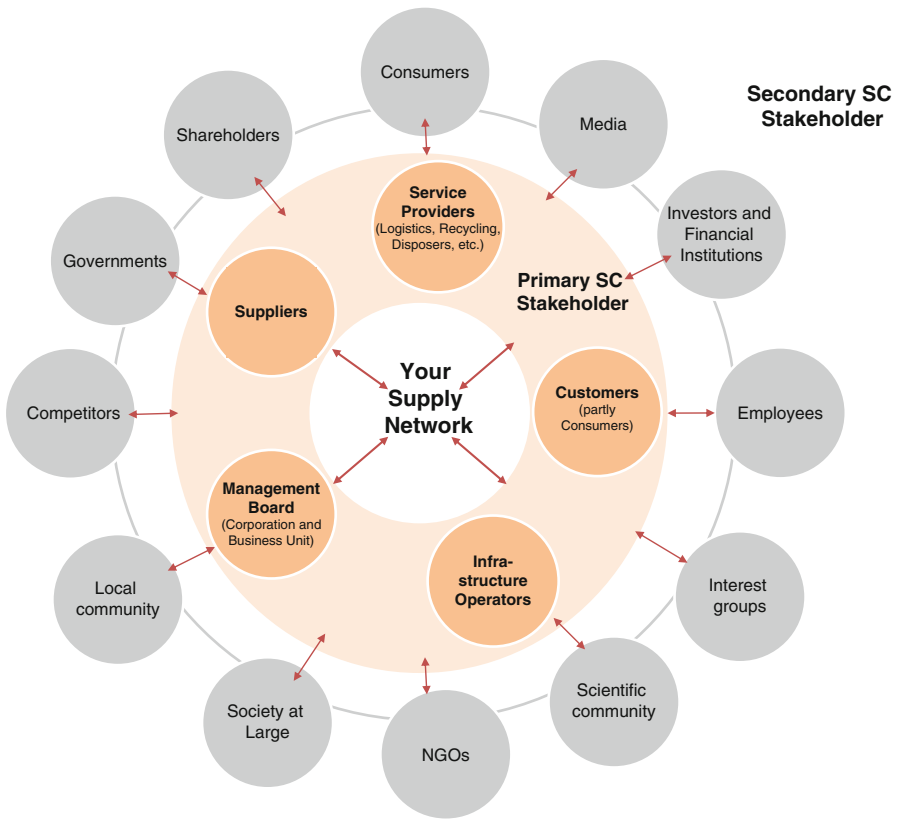


Fig. 2.8 Primary and secondary supply chain stakeholders

¹⁴Some stakeholder theories consider shareholders also as stakeholders. I do so, too. See Chap. 6.

¹⁵See Chap. 5.

Supply chain input resources such as fuel, energy, and natural resources nowadays deserve close attention in supply chain management logistics. The trend of rising prices and increasing scarcity make input resources major risk management factors in an economic perspective, especially if you run cost- and energy-sensitive supply chains, such as the commodity micro chip industry with its international production and transport flows for example. Understanding and forecasting input resource-related information helps in developing your sustainable supply chain strategy.

One well known and useful tool to use in step 2 is “Scenario Planning”. This is a method of medium- and long-term planning, simulation, and of forecasting probable future developments based on the continuous observation of indicators. Scenarios allow supply chain managers to gain a better understanding of the possible business environments they will need to tackle in the future.

The first step in determining the scenarios is to explore the drivers that are most likely to shape the future of your supply chain. These are primarily, as mentioned earlier, the stakeholders and the supply chain input resources. For practical reasons, the number of possible basic scenarios is usually limited to the following three types: optimistic, pessimistic, and most likely. The analysis of existing practices during step 1 may help to determine some of the drivers and trends. In a highly uncertain business environment as described earlier, it makes sense to analyse the drivers according to two criteria: first, their predictability, and second, their impact on your supply chain (see Fig. 2.9).

Step 2 ends with a set of current, potential, and future requirements for different stakeholders and input resources. These feed into the next step, where they will be assessed together with the status quo of the supply chain.

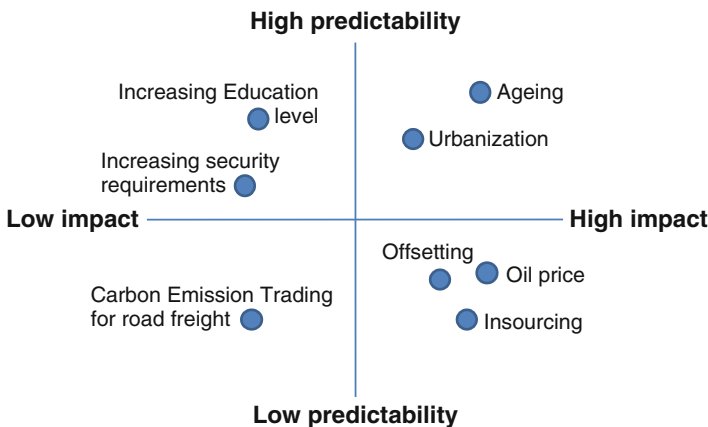


Fig. 2.9 Clustering scenario drivers – examples

2.4.3 Step 3. Evaluation: Identifying Potential Risks and Opportunities

Based on the assessment of your supply chain and of your business environment, you can now identify potential risks and opportunities. These will serve in step 4 to change or re-design your existing supply chain strategy. We have given a separate chapter to the topic of risk management, as increasing complexity, accelerating change and uncertainty are posing growing challenges for supply chain managers on the way to a sustainable supply chain.¹⁶

The following evaluation framework allows you to assess your supply chain capabilities in the context of the scenarios you have prioritised from step 2. The assessment then serves to determine your supply chain specific Threat-Opportunity-Profile (see Fig. 2.10). You need to understand the cause-and-effect relationships between potential success factors to undertake this evaluation. For example, you should be able to estimate that the regionalization of procurement structures in response to an oil price increase would be likely to reduce your transport costs by $x\%$. Only an effective understanding of the relevant levers in your supply chain and of their potential impact on the planning scenarios permit precise analysis of strengths and weaknesses and finally the “right” definition of risks and opportunities.

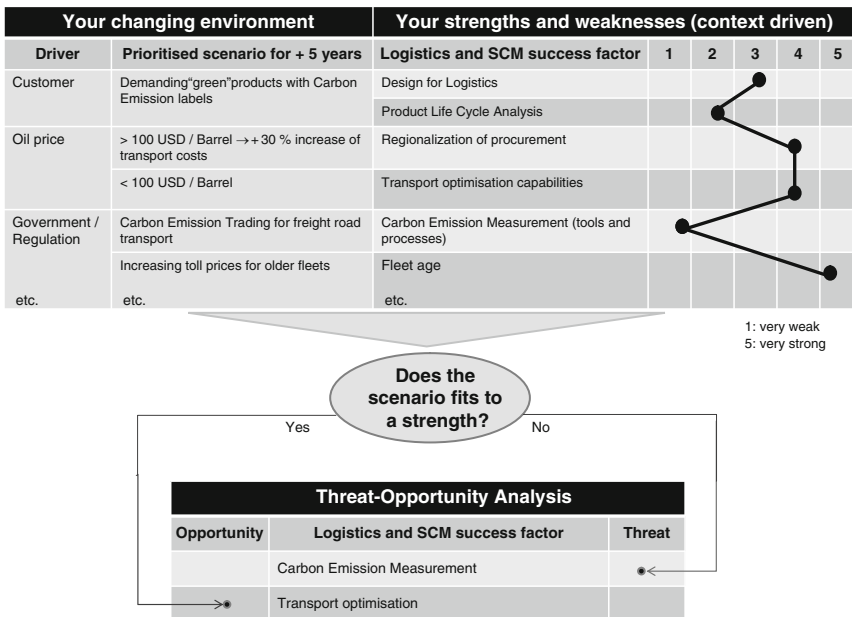


Fig. 2.10 Threat-Opportunity-Profiles for the sustainable supply chain strategy

¹⁶See Chap. 5.

2.4.4 Step 4. Action Plan: Extend or Re-design the Supply Chain Strategy

Based on the Threat-Opportunity-Profile, you can now define strategic gaps on the route to a sustainable supply chain; gaps between your current supply chain strategy and the changing business environment. The greater and more relevant the potential risks and opportunities, the larger will be the gaps, and the greater the need to act and make strategy changes. As mentioned earlier, the integration of sustainability principles into the supply chain is usually not a greenfield development; it has to be a step-by-step approach.

The scope of this supply chain review can vary. The larger the gaps, the broader the implications for implementing change, and the more aggressive the strategic programme and the associated action plan must be. The extension or the re-design of your existing supply chain strategy should be precisely defined. Of course, this is a strongly context-driven process, and based primarily on the results you have now obtained from this six-step approach.

Let’s have a detailed look at following Fig. 2.11. The *implementation level* determines who you involve in the implementation of initiatives. These actors could be the members of your own supply chain, which you influence directly; they could extend further to scope 1 externals from the end-to-end supply chain (primary supply chain stakeholders), or yet further to scope 1 and 2 (secondary) stakeholders. The implementation level involves more than the parties involved; it is also defined by the time horizon you consider in your program.

The implementation level should not be mixed up with the driving forces you take into account when developing your plans. For example, the “compliance” program naturally requires a good understanding of governmental and regulatory

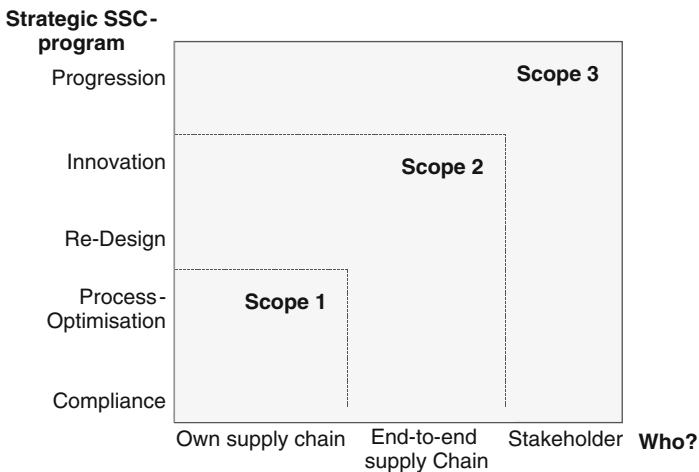


Fig. 2.11 Scope of sustainable supply chain strategy implementation

requirements, but you will not aim to develop and implement compliance solutions proactively together with policy makers.

The *strategic sustainable supply chain program (SSC-program)* determines the set of actions/initiatives needed to close the gap and to create your customized sustainable supply chain on the long-term; customized because it fits your gap precisely. The following strategic programs can be distinguished:

1. Compliance
2. Process-Re-engineering
3. Restructuring
4. Innovation
5. Progression

Again, the strategic program does not represent a new supply chain strategy, rather a program to extend or re-design the existing strategy. And again, the bigger the gap, the stronger and more aggressive will be the action that needs to be taken. The first two programs are essentially defensive and focus mainly on the company's own supply chain. The last three programs are more aggressive and require an extended implementation level beyond the company's own supply chain. Below we will take a brief look at each of these strategic programs, together with some examples and case study references:

Strategic SSC-Program: “Compliance” Supply chain managers should follow the “Compliance” program to obtain the benefit and competitive value of “Reducing and managing risk”, which represents a precautionary response to stakeholders, shareholders, owners, and employees in particular. This program is mainly driven by the compliance requirements of stakeholders such as governments, customers, and special interest groups. Supply chain managers satisfy their stakeholders' concrete requirements and monitor developments in the regulatory arena. Some examples of program actions, described in part in the bestLog case studies, include:

- Certification of adherence to mandatory standards
- Certification of adherence to customer-specific standards
- Monitoring of planned new regulations

Strategic SSC-Program: “Process Optimisation” Supply chain managers should follow the “Process Optimisation” program to obtain the benefit and competitive value of “improving productivity and efficiency” and in consequence, of reduced supply chain costs, increased resource productivity, and reduced environmental impacts. This program is mainly driven by additional supply chain and logistics costs, due to e.g. increasing resource prices or increasing regulation compliance costs.

Actions taken to improve efficiency do not aim to change existing structures; rather try to improve the existing system itself, based on optimisation and improved planning. The overall goal is to invest in improvements showing a positive net present value in the short term; this is difficult in many cases of current, existing “green”

technologies, for example. The scope of such activities starts within the company and should be extended to the whole supply chain. The first activities should focus on the “low-hanging fruit” and on the areas in which supply chain managers already operate and respond to change, e.g. transport planning. Some examples of program actions, some of them described in the bestLog case studies, include:

- Training of truck drivers
- Simple re-design of packaging or optimised packaging processes
- Implementation of environmental management systems, to standardise processes and to reduce unnecessary complexity costs.
- Consolidation of material flows by re-scheduling
- Route optimisation and transport planning
- Business process optimisation to reduce lead times, which enable longer planning cycles, which in turn create more consolidation possibilities
- Applying intermodal transport
- Applying fleet management systems
- Energy management in warehouses

Shift from Defensive to Aggressive Strategic SSC-Programs These first two strategic SSC-programs fit very well for companies and supply chains with cost leadership strategies and efficient supply chain processes. Successful implementation of these programs can satisfy competitive requirements, if the regulatory and cost risks – defined by the Threat-Opportunity-Profile – remain only potential and do not affect long-term competitiveness.

But one common finding in the literature and within the bestLog practitioner community is that cost advantages based on efficiency and productivity concepts do not lead to a long-term, sustainable competitive advantage; this is because (a) competitors will most probably have the same opportunities to emulate such cost advantages and (b) efficiency and productivity improvements fail, if the concepts do not achieve the required critical mass of throughput: for example, during the 2008 global economic crisis. And in addition to that: The high investment demands of logistics-related technologies (e.g. regenerative energy, alternative-fuel engines, telematics, etc.), have often long payback periods and lead to higher logistics costs, which such companies will most likely pass to the customers or partners, if they stick to the mentioned cost leader strategy. This means that cost leader companies with cost-efficient supply chain strategies face big challenges in aligning efficiency strategies with sustainability principles in the long run.

In conclusion, the stand-alone integration of the “Process-Optimisation” and “Compliance” SSC-programs will not necessarily lead to competitive advantages, if the strategic gap in the context under consideration is large and very diverse, and along the main supply chain; in more concrete terms, you should shift to more aggressive strategies and extend programs to further implementation levels when stakeholders create strong direct and indirect pressure on the supply chain, or when sustainability drivers such as, for example, rising resource prices impact forcefully on current and future supply chain performance.

Strategic SSC-Program: “Re-design” Supply chain managers should follow the “Re-design” program to obtain the benefit and competitive value of “the long term and cardinal improvement of effectiveness and early prevention of risk”. This program is mainly driven by additional supply chain and logistics costs resulting from rapidly increasing resource prices and regulatory costs which affect a company’s competitive position. The actions around “Re-design” aim to change existing structures and processes. The scope of activities covers the whole supply chain. Hence, a collaborative approach is one key success factor. The decision making processes needs to be quantified as much as possible, in order to draw up and assess several scenarios, since re-design actions are mostly linked to high costs and investments, and are often irreversible. Some examples of program actions, some of them described in the bestLog case studies include:

- Regionalization of procurement and production structures
- Hub strategies in the distribution network
- Closed-loop supply chain management
- Re-assessment and substitution of suppliers and logistics service providers
- Business Process Reengineering (BPR)

Strategic SSC-Program: “Innovation” Supply chain managers should follow the “Innovation” program to obtain the benefit and competitive value of “differentiation”. This program is mainly driven by external stakeholders: customers, consumers, NGOs and suppliers who demand new solutions, products, and services.

The actions around “Innovation” aim to change existing business models, to break existing mindsets in the supply chain, and to achieve a sustainable¹⁷ image, which, in the end, will increase the credibility of a company. The scope of activities is mainly intra-organisational, e.g. between R&D, SCM, manufacturing, and sales as well as inter-organisational in the end-to-end supply chain. Hence, communication and awareness are key success factors; top management commitment throughout the key supply chain players is a must. Some examples of program actions, some described in the bestLog case studies, include:

- Innovation management for new products and supply chain services
- Price differentiation for premium, sustainable supply chain services and products
- Design for logistics (product and packaging)
- Training and education
- Incentive systems for employees and partners
- Profit-sharing models for supplier and logistics service provider
- Remanufacturing
- Knowledge and best practice platforms
- Carbon footprint labels on products and services

Strategic SSC-Program: “Progression” Supply chain managers should follow the “Progression” strategy to obtain the benefit and competitive value of

¹⁷Not just strong communication and marketing, rather a structural internal change.

“differentiation, first mover advantage, and establishing market entry barriers”. The main drivers in the relevant industry, and even society as a whole are: a lack of standards, of knowledge, and of regulations, highly developed corporate social responsibility, and a lack of common market direction.

The actions around “Progression” do not have a direct, measurable payback for a given time period. The benefits are more long-term and qualitative, and go along with reputation and image. The reach of activities is wide spread mainly found in the relevant sector, at governmental institutions, at associations, and in different countries. Hence, a focused approach with concrete milestones is a key success factors, top-management commitment along the key supply chain players is a must. Some examples of actions, some described in the bestLog case studies, include:

- Investing money and time in establishing new standards in the market, e.g. a CO₂ emission measurement standard in the transport sector.
- Funding research institutions and research projects and surveys.
- Funding of relevant NGOs
- Active involvement in associations
- Establishing knowledge exchange platforms
- Communication, discussion, and consulting with politics and regulation.

2.4.5 Step 5. Implementation with the Sustainable Supply Chain (SSC-)Scorecard

What is the status of our iterative six-step approach with respect to the identified main ingredients of a sustainable supply chain strategy? Ideally, we will have selected the appropriate scope of strategic vision and determined the right related actions to align your supply chain strategy to the changing business environment. Most future trends and scenarios have been considered and taken into account. Finally, these findings have been incorporated into the reformulation or re-design of your existing supply chain strategy and the associated objectives. The next question is, “How to get there?”

We are still facing the challenges of making strategy ready to put into operation, and of balancing economic, environmental and social objectives. Potential trade-offs along the supply chain are still not visible. The lack of cause-and-effect understanding is likely to lead to an imbalance in these three dimensions of sustainability. The capability to translate the new strategy elements into a structured KPI system, explaining cause-and-effect relationships and justifying implemented practices, remains a challenge ahead of us. Step 5 will address these issues.

One well known tool/concept for translating strategic goals into operations is the “Balanced Scorecard” developed by Kaplan and Norton from 1990. The Balanced Scorecard is a (performance) management system providing a framework to translate a strategy into balanced operational terms via objectives and measures,

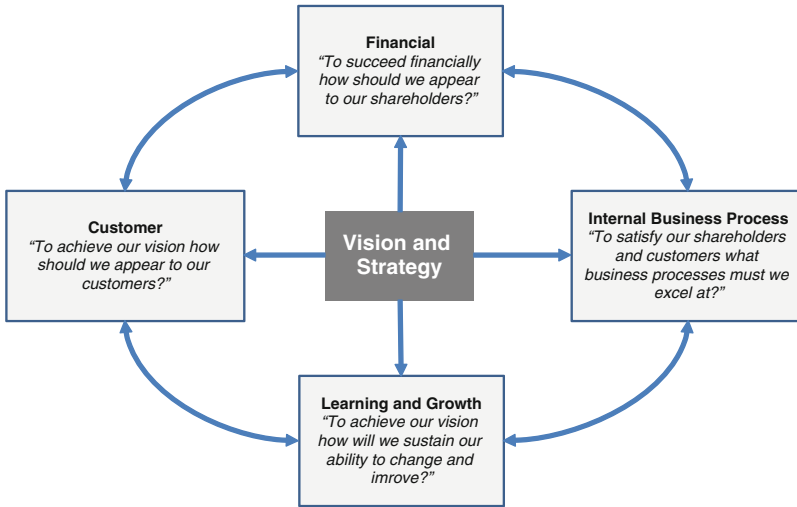


Fig. 2.12 The Kaplan/Norton Balanced Scorecard

organised into four different perspectives: financial, customer, internal business process, and learning and growth (see Fig. 2.12).

"The Balanced Scorecard expands the set of business unit objectives beyond summary financial measures. Corporate executives can measure how their business units create value for current and future customers and how they must enhance internal capabilities and the investment in people, systems, and procedures necessary to improve future performance."¹⁸

The measures represent a balance (Kaplan and Norton (1996), p. 9)

- Between *external* measures for shareholders and customers, and *internal* measures of critical business processes, innovation, and learning and growth,
- Between the *outcome* measures – the result from past efforts- and the measures that *drive future* performance, and
- Between *objective*, easily quantified outcome measures and *subjective*, somewhat judgmental, performance drivers of the outcome measures.

These characteristics fit ideally with our ingredients of a sustainable strategy and justify the use of this general concept, but not as a pure performance measurement system. "Many people think of measurement as a tool to control behaviour and to evaluate past performance. The measures on a Balanced Scorecard are used in a different way – to articulate the strategy of the business, to communicate the strategy of the business, and to help align individual, organisational, and cross-departmental initiatives to achieve a common goal. Used in this way, the scorecard does not strive to keep individuals and organisational units in compliance with a pre-established

¹⁸Kaplan and Norton (1996), p. 8.

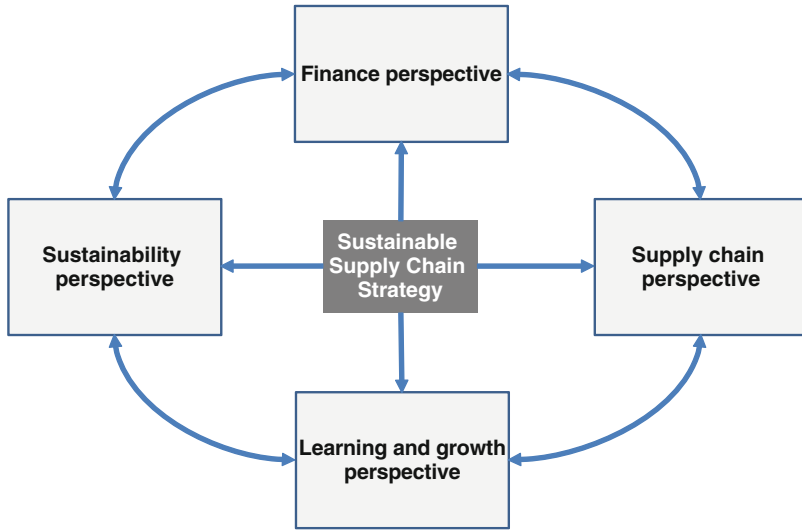


Fig. 2.13 The Sustainable Supply Chain (SSC-)Scorecard Perspectives

plan, the traditional control system objective. The Balanced Scorecard is used as a communication, informing, and learning system, not a controlling system.”¹⁹

The Balanced Scorecard is in use in many companies worldwide. Its success led to the application of the concept to other areas such as marketing, environmental management, production – or supply chain management. Indeed, several sustainability scorecards and supply chain management scorecards have been developed, but separately. Literature analysis on well known scorecards shows that none of them integrate both perspectives. The following illustrations show such an integrated Sustainable Supply Chain (SSC-)Scorecard and the relations between its four perspectives (Fig.2.13 and 2.14). As sustainability basis on and implies a “balance”, the word “balanced” was taken out of the designation.

The comparison of the SSC-Scorecard with the “traditional” Balanced Scorecard of Kaplan and Norton shows the structural similarities. The four perspectives, Finance, Customers, Processes, and Learning and Growth, are retained, and are extended by several other aspects regarding supply chains and sustainability. The main reason to stick with the traditional four perspectives is to allow an “easier” integration and “plug-in” to a company’s existing used of a “traditional” Balanced Scorecard. Let’s have a detailed look on the SSC-Scorecard on Fig. 2.14.

¹⁹Kaplan and Norton (1996), p. 25.

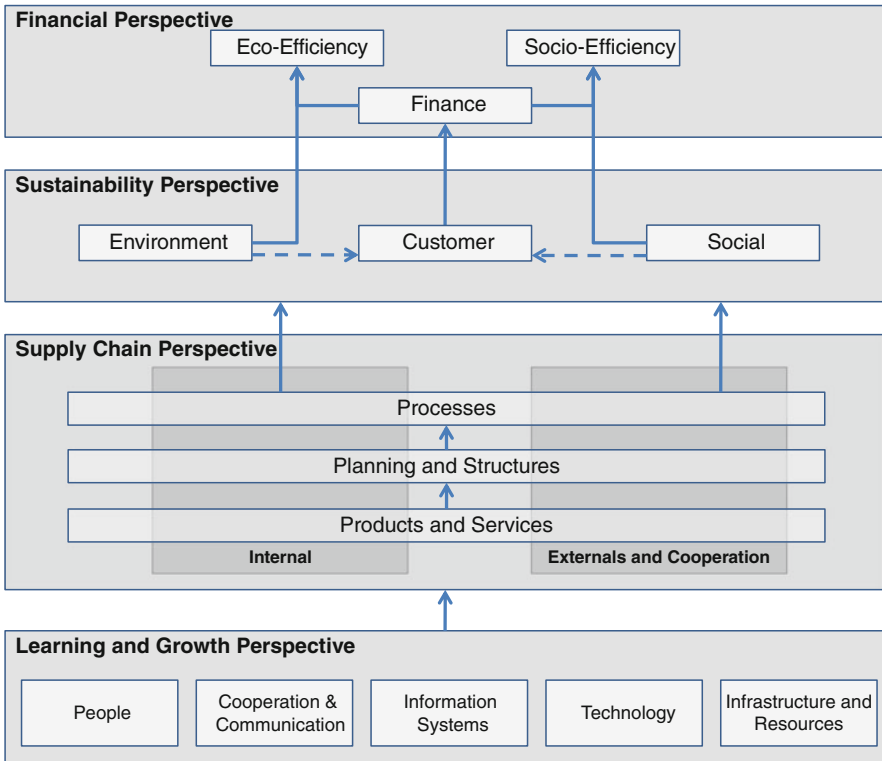


Fig. 2.14 Sustainable Supply Chain (SSC)-Scorecard – relations of the perspectives

2.4.6 SSC-Scorecard: The Financial Perspective

Actions into principle: Assess social and ecologic activities accurately from the economic point of view.

The SSC-Scorecard retains the financial perspective of the traditional version, since financial measures are valuable in summarizing the consequences of actions already undertaken (Fig. 2.15). Furthermore, sustainable financial results are the key objectives of all companies, and justify their existence in today’s business environment.²⁰ This is also why this perspective forms the target framework for all other perspectives.

The SSC-Scorecard extends the traditional financial perspective with a further dimension related to environmental and social impacts: The (socio- and eco-) efficiency dimension. The idea behind this new dimension is to link the financial perspective with the other two sustainability dimensions. The aim is to assess social

²⁰Except non-profit organisations.

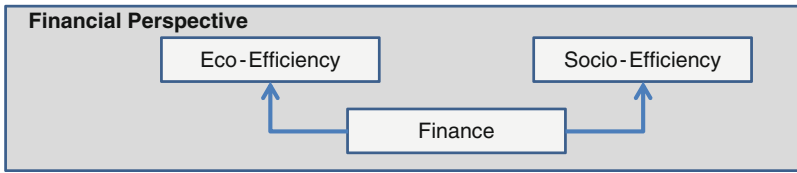


Fig. 2.15 The financial perspective of the SSC-Scorecard

and environmental activities from an economic point of view. Profitability and efficiency issues arise at the beginning and end of all activities involved in creating a sustainable supply chain, simply because activities must be financed and must provide a pay back after a specified time.

Bjorn Stigson, President of World Business Council for Sustainable Development (WBCSD), puts it this way: “This is what eco-efficiency is all about: combining the goals of business excellence and environmental excellence, and creating the link through which corporate behavior can support sustainable development”.²¹ This is one fundamental step to achieve the desired balance between economic, environmental, and social objectives, because compromises will only be offered or accepted by the people involved if the activity shows a high level of improvement while balancing environmental, economic, and social concerns.

The traditional measures for the financial perspective include Return on Capital Employed, Return on Investment, Return on Assets, Shareholder Value, Economic Value Added, and Market Value Added. Financial ratios influenced by supply chain management and logistics include Working Capital Efficiency, Operating Cost Reduction, and Fixed Capital Efficiency.

The basic calculation of the eco- and socio-efficiency measure is according to WBCSD:

$$= \text{Product or Service Value} / \text{Environmental or Social Influence}$$

Using this basic equation, companies can calculate eco-efficiency in a number of ways. The choice of indicators will depend on the needs of individual decision makers:

- A plant manager may wish to focus on the number of products shipped per kilojoule of energy consumed during manufacturing.
- A financial analyst may instead focus on the economic value of products sold per kilojoule.

The WBCSD therefore has developed a common framework for eco-efficiency indicators, with terminology consistent with the ISO 14000 series and the Global Reporting Initiative (GRI).²²

²¹WBCSD (2005), p. 3.

²²WBCSD (2005)

2.4.7 SSC-Scorecard: The Sustainability Perspective

Actions into principle: Link financial figures with customer needs. Extend this link by the environmental and social perspective.

The SSC-Scorecard retains a sustainability perspective, including the customer perspective of the traditional BSC (Fig. 2.16). “In the customer perspective of the Balanced Scorecard, managers identify the customer and market segments in which the business unit will compete and the measures of the business unit’s performance in these targeted segments. This perspective typically includes several core or generic measures of the successful outcomes from a well-formulated and – implemented strategy. The core outcome measures include customer satisfaction, customer retention, new customer acquisition, customer profitability, and market and account share in targeted segments. But the customer perspective should also include specific measures of the value propositions that the company will deliver to customers in targeted market segments.”²³

The sustainability perspective of the SSC-Scorecard extends the customer perspective into the environmental and social performance dimensions. Both serve to measure the impact of your relevant supply chain on environmental and social performance KPIs. We have given performance measurement a separate chapter in this book, in which several such KPIs are described in detail.

One reason to put these two “new” elements into a single perspective together with the customer perspective is their potentially strong links. Customer and market segments of some industries, e.g. the retail sector, create direct environmental and social pressure. Hence, environmental and social responsibility performance may influence traditional core outcome measures such as customer satisfaction or new customer acquisition. Hence, the link serves to understand the impact of your sustainability performance on the competition from the customer perspective. Another reason to join these two elements within this “second”²⁴ perspective is to construct a causal relationship between the supply chain and the financial perspective. In both theory and practice it is desirable to measure the value proposition of a

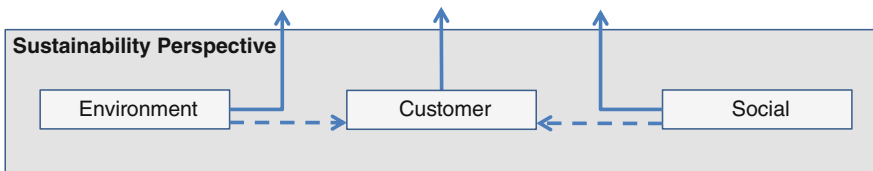


Fig. 2.16 The sustainability perspective of the SSC-scorecard

²³Kaplan and Norton (1996).

²⁴The perspectives are sorted in a sequence shown on Fig. 2.14, which represent the cause-effect relationships of the different perspectives. Hence, the sustainability perspective represents the second perspective.

supply chain at the company level, ideally in monetary terms. Some concepts do this very well, but only in financial terms, e.g. the Economic-value-added (EVA) model. The sustainability perspective between the financial and supply chain perspective extends these concepts by measuring the value proposition in environmental, social and economic terms, ideally linked to different supply chain resources (a “fourth perspective”).

2.4.8 SSC-Scorecard: The Supply Chain Perspective

Actions into principle: Incorporate tactical and strategic decisions along the end-to-end supply chain. Collaborate with your sales and product development departments and partners.

The SSC-Scorecard retains a supply chain perspective, including the internal-business-process perspective known from the traditional BSC. In the supply chain perspective, supply chain managers identify and improve the critical and key factors in which the supply chain must excel. Kaplan and Norton emphasize that only those process objectives should be established which serve to attract and retain the identified customers and which serve to achieve the defined financial goals.²⁵ The same requirement is valid for the SSC-Scorecard: Focus only on those supply chain factors that will have the greatest impact on customer, environmental and social goals, and consequently, on the defined financial goals.

Therefore the SSC-Scorecard extends the internal process viewpoint of Kaplan by another view, particularly relevant to supply chains: The External and Cooperation viewpoint. The justification for this is simple: External parties such as suppliers and logistics service providers affect (a) the internal processes of your company in terms of process capability and process reliability and (b) affect the sustainability performance of the whole supply chain; the supply chain you are part of or maybe, as an OEM, to which you respond from a stakeholder point of view. This differentiation in the SSC-Scorecard allows you to link the sustainability perspective and its associated sustainability performance indicators to internal and external *influence factors* in the supply chain perspective.

But what factors in a supply chain influence its sustainability performance? Let us look to the customer in the sustainability perspective. The customer judges the quality and service of a company based on the products and the service it gets; in logistics terms, for example, a late delivery. The environmental performance of a company is similarly the result of the physical operations of a company; in logistics terms, for example, the CO₂ emissions or the fuel consumption of a truck. Similarly with social performance, when we talk about traffic accidents, for example. Hence we can see that sustainability performance is directly influenced by operational processes in the supply chain perspective. This clear cause-effect relationship is

²⁵Kaplan and Norton (1996), p. 26 ff.

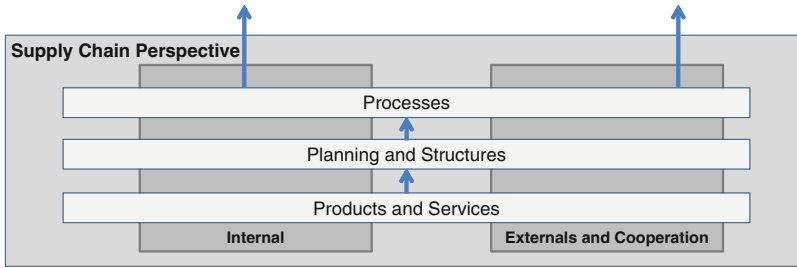


Fig. 2.17 The supply chain perspective of the SSC-Scorecard

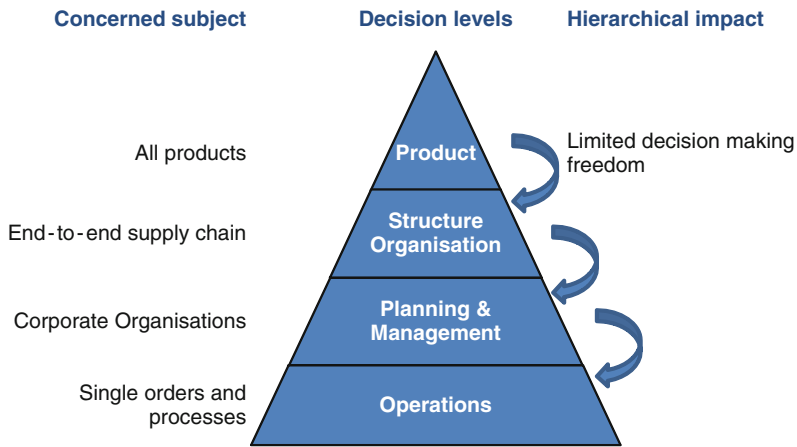


Fig. 2.18 Decision pyramid in supply chain management

reason enough to put the process dimension into the supply chain perspective within the SC-scorecard (see Fig. 2.17).

But should the supply chain perspective end at this point? Definitely not, because the impact of processes on the sustainability dimensions is mostly determined by previous supply chain planning and supply chain design decisions; and even by product design decisions (see Fig. 2.18). The shown four decision levels are different with regard to the time frame, scope, implications and deployment of capital and resources. Hence, the levels form a hierarchy and influence each other sequentially. Decisions at one level define the leeway for action with regard to further decision on the following levels, as decisions at a higher level curtail decision-making freedom at lower levels. Here is an example with regard to the environmental performance: A company decides to create a central warehouse strategy for its distribution operations. This structural decision constitutes a fixed parameter on the process level and has a key influence on the number of transport

kilometres within the supply network; this in turn has a major effect on the volume of fuel required, or CO₂ emissions, by the company in question. Companies can obviously reduce overall fuel costs or CO₂ emissions by implementing optimisation policies at the process levels – by using route planning software, fleet control systems or alternative fuels, for example. But the decision with the broader scope and wider implications will have already been taken at the supply chain design level. Again, this clear cause–effect relationship is reason enough to put the “planning and structures” dimension into the supply chain perspective within the SC-scorecard (see Figs. 2.14 and 2.17).

Again the question: should the supply chain perspective end at this point? And again: No. According to the funnel-like logic shown in Fig. 2.18 all strategic and tactical decisions regarding planning and structures are, or rather should be, aligned to the products they supply, in particular with regard to product demand characteristics and, as already mentioned, with regard to product design. You will remember from Sect. 2.2 – on supply chain strategies – that different “demand” characteristics at product level impose distinctive supply chain planning and supply chain design requirements. Again, this clear causal relationship is reason enough to put the “product” dimension into the supply chain perspective within the SC-scorecard (see Figs. 2.14 and 2.17).

I will close this section with a final example showing the importance of these three interlinked dimensions within the supply chain perspective. The stipulated packaging dimensions of a product define the volume and the weight of the product and consequently the maximum number of products per load carrier – say per container load. This means that the decision on product design level influences the maximum theoretical utilisation of the space in a container, and therefore the capacity utilisation of a single transport vehicle, which would be assigned to the process level. The effects on the environment – in the form of CO₂ emissions per transported unit of the product – are therefore largely dependent on the decision on packaging dimensions at product design level. Actions on the planning and process levels such as route optimisation may naturally also have an impact on CO₂ emissions, but they have to be based on the fixed parameters of volume and weight and are therefore of lesser significance to environmental and resource protection.

2.4.9 SSC-Scorecard: The Learning and Growth Perspective

Actions into principle: Drive supply chain wide learning

The fourth and final perspective on the SSC-Scorecard aims to drive learning and growth in the supply chain. The SSC-Scorecard is in this respect firmly based on the traditional Balanced Scorecard of Kaplan and Norton. They postulate that objectives in this perspective enable the objectives and drive excellent outcomes in

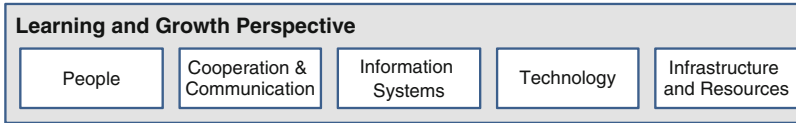


Fig. 2.19 The learning and growth perspective of the SSC-scorecard

the first three scorecard perspectives. Kaplan and Norton have defined three principal categories for the learning and growth perspective:

1. Employee capabilities
2. Information systems capabilities
3. Motivation, empowerment, and alignment²⁶

These three categories are clearly also valid for sustainable supply chain development. However a sustainable supply chain strategy must extend the view along the whole supply chain and even beyond it. The learning and growth perspective of the SSC-Scorecards therefore comprises the following five principal categories (Fig. 2.19):

1. People capabilities
2. Cooperation and Communication: Trust, motivation, empowerment, and alignment
3. Information systems capabilities
4. Technology capabilities
5. Infrastructure and energy resources

The SSC-Scorecards extends the employee category of Kaplan and Norton, because the capabilities of people among your suppliers or service providers and even your customers deserve attention in a sustainable supply chain. Effective communication and cooperation based on trust and alignment of interests and objectives are essential to sustainable supply chains in the long term.

Furthermore, a sustainable supply chain strategy must pay attention to the development of technologies, infrastructure, and energy resources along the supply chain. Hence, the SSC-Scorecard extends the categories of Kaplan and Norton by the following:

- (a) Technology capabilities: Technology plays an important role in today's supply chains and logistics. Transportation, warehousing, packaging, identification, and handling are increasingly impacted by technological developments. Interestingly many recent innovations in this area are about environmental protection, resource protection, social, and safety topics – all key ingredients of the sustainable development we are aiming for. Some technology examples

²⁶Kaplan and Norton (1996), p. 127.

include: alternative fuels, hybrid powertrains, lane departure warning and automatic distance maintenance assist for trucks, renewable energy for warehouses, etc.

- (b) Infrastructure and Energy Resources: Logistics and transport use infrastructure such as roads and energy resources such as fuel to operate. The SSC-Scorecard aims to monitor infrastructure- and energy resource-related data, which may affect the objectives of the three other SSC-Scorecard perspectives. For example, if a company aims to have reduced transport costs in its transport-intensive operations, the monitoring of fuel price and toll charges will deserve close attention. Examples of infrastructure and resource data include: infrastructure charging (e.g. tolls), speed and driver rest policies, oil prices, the price of emission certificates, infrastructure operator charges, the services and prices of service providers (e.g. a new intermodal connection from A to B), etc.

It is important in this scorecard-group not to create too many KPIs. The purpose of the infrastructure and energy resource grouping is to identify and then monitor those elements which may have a critical effect on the objectives of the following three perspectives. This Scorecard group is not intended support day-to-day operations as an information system.

The learning and growth perspective of the SSC-perspective feeds directly into the supply chain perspective, which is divided into an internal and an external perspective. Assignments split between the external and internal perspectives allow you to derive separate activities and to adjust your supply chain collaboration and business model according to the resources and capabilities available.

The learning and growth perspective is the last perspective of the SSC-Scorecard. The four perspectives and all their sub-groups represent a template. They are not carved in stone; rather, they are intended to serve as a generic model, to be adjusted to fit your own distinctive industry, company, and regional factors. To continue our six-step approach: Take your re-designed or new supply chain strategy, take this SSC-Scorecard, take the KPIs from Chap. 3, take the cases shown in this book onto the best practice platform, and start to put your new supply chain strategy into operation. Bear in mind that the SSC-Scorecard is more than a tactical and operational measurement system. It serves as a strategic management system, to help you manage the strategy over the long run.²⁷

The next, final step is to implement the strategy and the SSC-Scorecard at a strategic level. You can focus on the ingredients and action items already mentioned in the previous section. The strategy development and integration approach ends with step 6. Nevertheless, the need for early adaptation of the supply chain to dynamic changes in the business environment requires an iterative application of this approach.

²⁷According to Kaplan and Norton (1996), p. 10.

2.5 Principles into Practice

The following are some summary conclusions derived from the content of this chapter and from the bestLog research.

1. Be aware of goal conflicts in implementing, pre-define them, and communicate them to your team and your executive board.
2. Monitor your stakeholders and your supply chain input resources and the risks and chances associated with them.
3. Follow an holistic approach to define strategic gaps.
4. Drive supply chain-wide learning.
5. Link financial measures with customer needs. Extend this link by the environmental and social perspective.
6. Extend the responsibility of your supply chain managers (cross-company and cross-functional).
7. Consider sustainability as an opportunity and not only as a risk.
8. Communicate your plans, successes and sometimes, your failures internally and externally.
9. Get commitment from your top management.
10. Develop your own customised Sustainable Supply Chain (balanced) Scorecard.
11. Develop realistic targets for your SSC-Scorecard.
12. Clarify and translate the strategy and vision.
13. Enable feedback and learning circles in your organisation.
14. Establish an appropriate organisational framework and training resources.
15. Create an appropriate culture and awareness along your supply chain.

Tasks:

- 1) Can you write down, without checking company documents, the mission, strategy and supply chain strategy of your chosen organisation? Can you list any organisational strategic goals?
- 2) Is sustainability included into your chosen company strategy and/or supply chain strategy? Discuss how company actions at the strategic level influence sustainability (for example by: choice of supply chain design, selection of transportation mode, sourcing).
- 3) How does your chosen organisation communicate strategic goals to its employees and stakeholders?
- 4) Using example companies, analyse products shown in Table 2.1. What is their key characteristic: primary, functional, or innovative? How does this influence supply chain design?
- 5) Using Table 2.2 as an example, analyse the strategy of your chosen organisation at different levels. Are they interlinked? Discuss any contradicting goals and how you can manage such conflicts?

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