

Success factors and fields of action

Markets, efficiency and eco-efficiency

Businesspeople primarily focus their actions on **market activity**. Market participants voluntarily contract to exchange their resources in a way that is beneficial to all participants. Markets operate on the basis of competition between producers and consumers. Consumer demand determines whether products and services can be sold by the producers of goods or by the suppliers of services. For example, consumer preferences determine whether sales are made, whether a limousine uses green fuel or whether a detergent ‘washes whiter than white’. Costs of supply help determine whether producers will offer a good or service for sale. Prices and costs of goods and services determine the quantity demanded and supplied at a given level of quality. Hence, the economic activities of consumers and producers are determined by market price. The relationship between price and costs provides an indication of the **economic efficiency** of the producer or service provider and of the success of socioeconomic management.

<i>Field of action</i>	<i>Market</i>
Main focus	Proportion of output to input
Question to be answered	What is the relationship between profits (yield) and costs (expenditure)?
Basis for action	Exchange and competition
Criterion for success	Efficiency
Focus	Economic

Table 8.1 Markets and efficiency

8.1 Efficiency and eco-efficiency as criteria of market success

Markets contribute to value creation by increasing the volume of goods and services available at prices that reflect efficient operations. Markets provide a decentralised and impersonal (in an ‘apolitical’ sense) way of making decisions about the allocation of goods and services, provided that potential participants have sufficient monetary wealth to transact in the marketplace. In turn, competition takes care of the need for participants to be efficient in the management of their organisational activities and processes. Of course, where a market has an **oligopolistic** (a few key suppliers) or a **monopolistic** (a single supplier) structure, market pricing can be less effective and consumers can pay more than they would in a more competitive situation. Likewise, if there is a single customer (a condition of **monopsony**), suppliers to the market may be disadvantaged and be unable to survive.

Since inputs to production are in limited supply, efficiency is a key consideration for businesses. Improved efficiency provides one means whereby a supplier of goods or services to a market can gain an advantage over the competition. Corporate efficiency is measured through productivity and profitability. **Productivity** refers to the technical relationship between inputs and outputs, whereas **profitability** refers to the monetary relationship (Schaltegger and Burritt 2000, 2001a). Profitability measures economic efficiency, whereas environmental efficiency is a specific example of technical efficiency that examines the relationship between environmental inputs and outputs.

Since the use of environmental resources is often based on situations where resources are being obtained at too low a price, or at a zero price (e.g. waste disposal in the ocean), and where those who cause environmental damages frequently do not pay the total costs associated with these environmental impacts, the value of the natural environment is only partially captured by the financial aspects of market activity. Therefore, integration of technical environmental efficiency and economic environmental efficiency (eco-efficiency) is required if environmental effects on productivity and profitability are each to be taken into account in the decisions made by business.

If efficiency is interpreted in a specific environmental way as being the ratio of desired output to input, business can talk about environmental efficiency. This specifies the relationship between desired environmental performance and environmental impact added by business activities:

$$\text{Environmental efficiency} = \frac{\text{desired output}}{\text{environmental impact added}} \quad [8.1]$$

Environmental impact added is defined as the total environmental effects or influences of corporate activities. These can be weighted with regard to their relative harm on the environment (Schaltegger and Sturm 1990: 280; see also Box 5.4 on page 31). Measurement of environmental impact added is based on calculations of material flows linked to methods for environmental accounting and environmental performance evaluation by business.

Every time that a business activity occurs there is an increase in environmental impact added—there is no value creation without environmental impact being added. Value and environmental impact added can be linked to each other either through consideration of products or through consideration of functions:

- Ecological product efficiency is a measure of the ratio between provision of a unit of product and the environmental impact added by that product (see Schaltegger and Burritt 2000; Schaltegger and Sturm 1992, 1994, 2000) over the whole, or over a part, of the product's life-cycle (e.g. the number of cars produced per unit of energy consumed). Product efficiency can be improved by implementing pollution prevention techniques or by introducing end-of-pipe devices, reduced use of inputs per unit or through substitution of resources. However, some products will never be as ecologically efficient as others in providing a certain service (e.g. a car will always be less ecologically efficient than a bicycle).
- Ecological function efficiency measures how much environmental impact is associated with the provision of a specific function in each period of time (see Schaltegger and Burritt 2000; Schaltegger and Sturm 1992, 1994, 2000). Ecological function efficiency is defined as the ratio between the provision of a function (e.g. painting a square metre of metal) and the associated environmental impact added (e.g. use of chemicals and metal resources). It can be improved by substituting functions that have a low efficiency with highly efficient functions (e.g. by using a bicycle instead of a car), by reducing the amount used to fulfil the function (e.g. use of car pools leads to a decreased demand for cars), by prolonging the life-span of products (e.g. by giving longer guarantees against corrosion on cars) and by improving product efficiency.

These are two relative measures of performance—they compare two factors as a proportion or ratio. Note that it is also important to consider the total output and the absolute environmental impact: a large number of ecologically efficient products can be more harmful than a small number of ecologically inefficient items.

Although an improvement in environmental product efficiency is desirable in principle, in most cases it can be less beneficial to the environment than improvements in function efficiency. Even the most economical car needs wider roads and parking space in comparison with a tram running on tracks or in comparison with a bicycle. Products can be seen as groups of functions; for example, a lipstick needs to deliver the product to the mouth, to allow the user to apply it cleanly, to be smooth rather than brittle, to be safe for human use and to be retractable when the lipstick has been applied. Each of these functions of the product can be improved by reducing its environmental impact added. Usually, the environmental impact added by a number of functions is changed at any one time during redesign (see Bredemeier *et al.* 1997).

The environmental view of efficiency is enlightening. For corporate decisions about environmental impacts, however, this non-economic view is necessary but not sufficient. In order to solve business problems in an environmentally and economically efficient way, the measures with the greatest environmental net income per

unit of capital expenditure (profitability) have to be determined. Therefore, to business, the relevant measure of performance is economic ecological efficiency or, in brief, **eco-efficiency** (Schaltegger and Sturm 1994: 283):

$$\text{Eco-efficiency} = \frac{\text{economic value creation}}{\text{environmental impact added}} \quad [8.2]$$

Eco-efficiency can be determined for all business actions and activities, even when they do not directly focus on environmental protection. The ratio of economic value created to ecological environmental impact added can be improved over time. For example, greater eco-efficiency occurs when environmental impact added is reduced as much as possible given a specific level of expenditure (e.g. the budget for the environmental protection department). Likewise, eco-efficiency can be improved when, for a given use of natural resources (environmental impact added), the lowest level of expenditure is incurred (net economic value is created). Hence, improved competition can also produce improved eco-efficiency.

To sum up, economically successful business management is marked by an improvement in eco-efficiency in business activities. Eco-efficiency is considered to be an important basis for decisions that are made in many businesses today,³ the idea becoming popular primarily through the activities of the World Business Council for Sustainable Development (WBCSD; see www.wbcsd.org) and the businessman Schmidheiny (1992).⁴

8.2 A market orientation, efficiency and market failure

Eco-efficient actions undertaken through choices made in markets means that business needs to work with market forces to achieve its environmental goals. **Market forces** are demand- and supply-oriented and rest on the ideas and ideals of competition. Actions arising through markets are **voluntary** because no business is required to be a participant in a market. Instead, willing buyers and sellers come together to form a market through the completion of mutually advantageous contracts. Markets can vary in the degree of efficiency present. Some markets are inefficient if the underlying premises of efficient markets do not hold; for example, if there are insufficient numbers of buyers and sellers, markets may be inefficient. Transactions in markets take place in a decentralised way, as individual buyers and sellers seek their own advantage through market transactions. Price, quantity, quality and required performance of the goods and services being bought and sold can be matched between buyers and sellers in a flexible and direct way (see Streit 1991). Markets can operate beyond sovereign nations and thereby overcome spatial bound-

2 For an example of a manufacturer, see www.basf.de; for the full range of industries involved, see www.environment.gov.au/epg/envirnet/eecp/examples.html.

3 A description of best practice in eco-efficiency can be found at www.eco-efficiency.net/edizione2001/eco_uk_best.htm.

aries. In this way, they contribute to cultural networking and globalisation of trade and commerce. This is particularly evident with the advent of electronic commerce, or e-commerce, instantly transacted through computers.

Despite these advantages from the perspective of efficiency in the conduct of business transactions, social and environmental problems demonstrate the market's inability to provide solutions to all problems. Efficiency is often supplemented with **equity** issues; where potential participants have no general purchasing power to enter markets, then inequity and social problems arise. Markets sometimes do not take all costs and benefits into their pricing of transactions in goods and services. Harmful consequences for the environment are caused by such examples of **market failure**. Economists talk of **external costs** (i.e. **externalities**) that are not paid for either by the businesses that cause the costs or by the beneficiaries that buy business products and services. People who benefit in this way are called '**free riders**'. External costs and free-riders lead to overuse of free **public goods**, such as air or water, that are available at no specific cost to the individual (Barton 1999). Market failure to take all, or full, costs into account when transactions take place is a prime reason why much environmental degradation is caused by business (see Fritsch *et al.* 1999; Pearce and Turner 1990).

Business can pass on to consumers only those additional costs for protection of the environment that either have to be passed on because of regulation or that provide the business with an **advantage** (and greater revenue) over its competitors. Environmental protection measures that do not save costs or establish any additional value for business customers are introduced only because of a **moral obligation** to society and the environment.

When establishing the general market conditions that affect commerce and trade, avoidance of market failure is primarily a task for the sphere of politics. If the government permits market failures, then this can be seen as a defect of the sphere of politics in avoiding environmental problems, thereby reflecting **government failure**.

Businesses can also influence the market framework within which they operate (see Schneidewind 1998), but once the market framework is established corporate decision-makers work closely to the rules established. If environmental goods are free, then competitive forces will not encourage business to reduce usage, because to do so might lead to bankruptcy, the inability to pay economic debts as they fall due or liquidation: the life of the business is brought to an end.

Market conditions constantly change. Technological innovation, new organisational structures, new laws and rules laid down by professional associations, media pressure, cyclical changes in the prosperity of a country (e.g. the recent crises in Asia and Japan) that affect income available to consumers, new working conditions—all these contribute to the dynamic of business management. In these circumstances, market or government failure exacerbates any problems that exist, such as those related to environmental problems. This can lead to fluidity in the strategies adopted by business towards the environment.

A market orientation implies the constant pursuit of possibilities for production and sale of goods that are more environmentally benign in order to capture the right moment for entry into and exit from the market. It encourages the introduction of

new products and processes into the market through technological innovation where an economic gain might be available.

This chapter:

- Invites readers to identify how the scope of existing markets can be transformed into markets that encourage the survival of sustainable business activity—through the introduction of new solutions, the elimination of waste, improved quality of life and promotion of the need for achievement in this area
- Prepares readers to co-operate in the development of markets that reflect environmental considerations—in other words, to participate in the removal of existing market failures through development of new markets, through the internalisation of environmental costs that at present fall outside the boundaries of the business, by encouraging pricing that incorporates environmental preservation and by supporting the introduction of environmental accounting systems that measure environmental impacts and provide relevant information, and by promoting the consideration by managers of environmental protection in all aspects of business activity

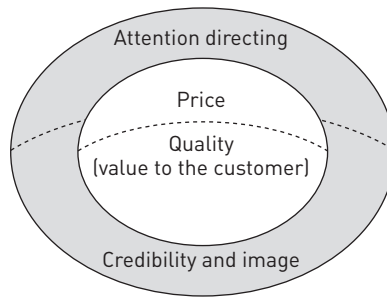
Readers will need to engage the socioeconomic sphere when striving to understand how markets and market mechanisms might be improved, but they will also become aware of limitations that can be resolved only through the sphere of politics and through the technological and legal spheres of action. Actors determine what happens in the market field through their interaction with the other spheres.

8.3 Competitive relationships

Actors transact in markets by making and accepting **agreements**, or **contracts**. From a business perspective, direct agreements are made for the development and design of processes and products, for purchases from suppliers, for the provision of economic capital, for the hiring of employees and for the provision of sales and after-sales services to customers. Apart from these direct relationships between the contracting parties to an agreement, a number of indirect relationships with competitors exist.

The dominant task of competitors is to capture demand for products that are offered to the market. In order to achieve this, competitors compete with each other by **underbidding** each other in terms of price, or **overbidding** in terms of the quality of goods and services provided. Quality is defined here as being represented by **value** of the product or its functions to the customer. **Information** available to the various parties is a critical aspect of these market relationships. Available information portrays the product's or service's **image** to consumers and can enhance credibility in the eyes of the consumer (see Fig. 8.1).

Information is always distributed to the markets in an uneven way (see Picot *et al.* 1998: 20ff.). Therefore, especially in markets where there are too many goods rela-



Note: The inner (unshaded) zone refers to the product; the outer (shaded) zone refers to information on the product.

Figure 8.1 Determinants of demand for products

tive to total market demand, the need to **direct** the **attention** of customers towards product features and functions is important to company success. Some information about production will always remain confidential, but information about characteristics and functions of products needs to be disclosed (made transparent) if customers are being asked for payment to purchase such products. Consequently, competition takes place at the different levels indicated in Figure 8.1.

A particular challenge for environmentally oriented business management lies in communicating the benefit of environmentally beneficial or benign aspects of a product or service in a **transparent** and **believable** manner. This is necessary in order to increase sales turnover or to justify a higher price where sales turnover is not being encouraged because of the need to conserve physical resources and to reduce waste-streams related to production.

The environmental characteristics of products are only rarely considered as 'inner qualities' of the goods offered for sale in the search for goods. **Experience goods** permit the buyer to use or taste the product before a final commitment to purchase has to be made. For businesses selling experience goods, return policies usually allow consumers to defer their final purchasing decisions until after they have gained some experience with the goods. **Trust goods** are very similar. If a product is claimed to be energy-efficient and it turns out not to be then return would be allowed within a specified period in order that the customer retain complete trust in the environmental claims or in the chemical composition of the product. Analysis and assessment of independent research institutes may be available in reports to help build trust or to demonstrate independent experience in relation to the product. With **potemkin goods** such evaluation procedures are not possible. Environmental qualities cannot be determined for these products. Hence, in the cases of experience, trust and potemkin goods information asymmetries exist between suppliers and consumers. In these circumstances opportunistic competitors may take advantage of the information asymmetry by providing false statements or distorted pictures about their own products (Fig. 8.2).

In order to overcome these hurdles related to information asymmetry, environmentally oriented business management is dependent on presenting an honest,

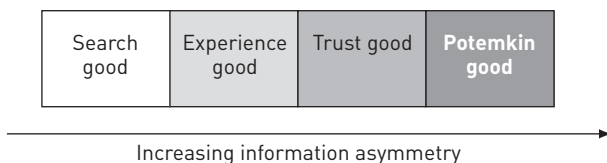


Figure 8.2 Information asymmetry in eco-marketing

Source: Tietzel and Weber 1991: 117

credible image. To promote honest environmental communication different instruments can be used. Evaluations from neutral institutes such as the magazines *Öko-Test* (www.oekotest.de) in Germany or *Choice* in Australia (www.choice.com.au), or certificates and labels such as the Japanese ‘Eco-mark’ (www.jeas.or.jp/ecomark/english) or the German ‘Blue Angel’ (*Blauer Umweltengel*; www.blauer-engel.de), document the product’s environmental benefits. In addition, business integrity combined with provision of transparent information on the product lend support to the development of trust and a possible competitive advantage (see Fichter 1998).

Continual improvement forms an important part of the ability to compete in a dynamic marketplace. This is required because as one competitor gains an advantage from a new environmental insight then another competitor strives to improve that achievement and regain the competitive advantage through **price reductions** or non-price means such as **innovations**. Porter (1999a) distinguishes strategies of competition related to differentiation of products. Environmental characteristics contribute to **differentiation** when they match effective demand for products (i.e. demand backed up by purchasing power or money). The process of differentiation flowing from one competitor to another presents an ideal picture of the market forces in action. The interaction of innovation and imitation enhances the dynamic of the market economy. In the ideal case, successful innovators pull the performance of the whole market upwards and in this way increase the movement towards sustainable development while at the same time satisfying consumer preferences for ‘greener’ goods.

So, through a process of general competition companies develop their own fields of business. These fields of business can be ranked in terms of the environmental problems associated with each field. Some fields of business are environmentally sensitive, whereas others are less sensitive. According to Dyllick *et al.* (1997: 60ff.) environmental fields of competition occur in three possible stages of development:

- Actual fields of competition mark existing opportunities for competition inside an existing branch of mass production. Additional environmental benefits are an important factor in customer purchasing decisions and lead to the replacement of conventional product varieties with improved products (e.g. energy-saving household appliances) (see www.aeg.de and www.eastaway.com.au/solutions_hm_2a.html).
- Latent fields of competition are available in market niches and are occupied by new companies that build up their businesses over time. Products

survive in the market, but they take time to break into the mass market (e.g. solar panels and wind turbines).⁴

- Potential fields of competition are highlighted by prototypes, methods and new product ideas that are at the research or development stage and attempt to solve a particular environmental problem (e.g. fuel cells and environmentally friendly vehicles).⁵

The transition of an environmentally benign product through its potential status, to the latent and, finally, actual fields of competition does not happen automatically or through coercion. Many new ideas simply do not get beyond the prototype stage because existing products currently appear to be more effective or because these new ideas are not pursued energetically enough in a business context. Even products that prove their worth in niche markets make their way into mass markets only when they have the support of business leaders that have sensed a market opportunity and have decided to take advantage of that opportunity.

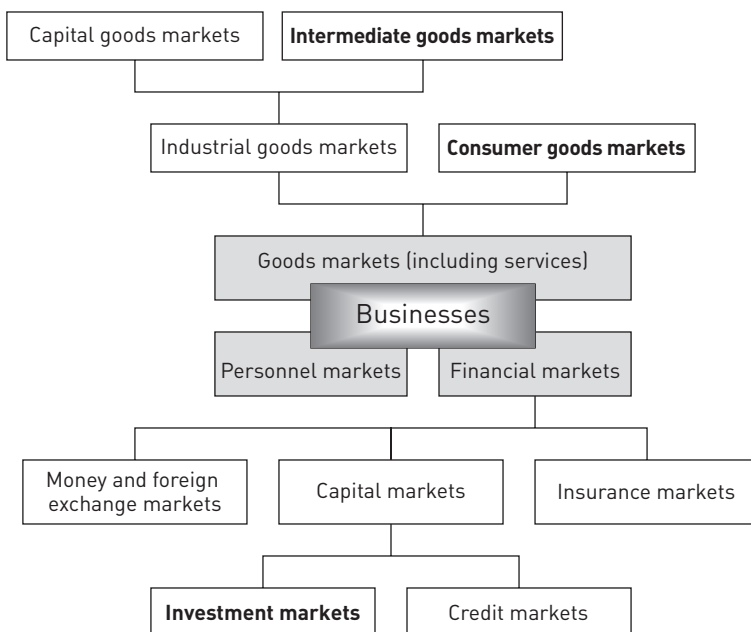
8.4 Relationships between customers and suppliers

Only an indirect link exists between suppliers and consumers of products. As shown in Figure 8.3, relationships between customers and suppliers can be classified in a number of different ways, depending on the type of the market and the nature of the product.

Exchange of goods and services takes place in markets only when the price is agreed between a willing buyer and a willing seller. Two types of goods market are important—the consumer goods market (called the final goods market) and the goods market for commercial organisations, business-to-business transactions (called the industrial goods market). The industrial goods market has two parts—the capital goods market and the intermediate goods market (i.e. relating to goods that will be transformed into final products to be sold in the consumer goods market). Note that the purchase and sale of goods has a close association with the financial markets. Money flows in the opposite direction from products and services in the goods markets. Hence, interaction with the financial markets is an integral part of successful business. Insurance of business activities, availability of credit, foreign exchange for overseas sales and purchases, equity, long-term debt and investment markets are all related to the financial markets and, for each type of finance, concerns can be raised about the impact of business activities on the environment. These environmental concerns might lead to difficulties in finance repayment to lenders. Detailed explanation of these markets and their connection with business environ-

4 On solar panels, see www.rueschsolar.ch; on wind turbines, see www.windpower.dk/core.htm.

5 On fuel cells, see www.innovation-brennstoffzelle.de; on environmentally friendly vehicles, see www.ford.com/en/vehicles/specialtyvehicles/environmental/default.htm.



Note: Markets set in bold type are those that will be focused on in this book.

Figure 8.3 Major types of market faced by a business

mental issues is beyond the scope of this book. Here, concentration is on the intermediate goods market, consumer goods market and the investment market (set in bold type in Fig. 8.3). Descriptions of these are given in Box 8.1. In the remaining sections of this chapter attention is drawn to relationships between stakeholders. The rest of the chapter is structured as follows:

- Section 8.4.1 looks at relationships between suppliers and consumers.
- Section 8.4.2 looks at relationships between manufacturers and wholesale traders.
- Section 8.4.3 looks at relationships in the intermediate goods market chain.
- Section 8.4.4 looks at relationships between capital providers and businesses.

8.4.1 Relationships between suppliers and consumers

The amount and variety of consumers and their needs is infinite. Consumer goods are designed to meet these needs. Present consumption provides individual enjoyment or wellbeing to consumers. Future consumption patterns and consumer needs are what drives competition in the private sphere. It is easier to secure economic gains from supplying intermediate goods to industry than to capture the market for

Consumer goods markets

Consumer goods markets are characterised by various institutions—for example, a large number of private households, retail businesses, tourist organisations and suppliers of services and food products. Between manufacturers and consumers there is a flow of **trade** from the **wholesale** to the **retail** level. Moreover, advertising agencies and forwarding agencies support or provide the logistics for **promoting sales**. Mass production and distribution through a range of distribution channels, including Internet sales, has been encouraged by the cost advantages that stem from specialisation and has promoted the development of a gap between manufacturers and consumers. Consumers often appear as abstract 'groups' or 'market segments'. Market and consumer research encourage an analytical approach towards targeting customers. However, whether goods really reach the customers they are aimed at is, in the end, determined by the extent and type of communication conducted through wholesale traders.

Intermediate goods markets

Intermediate goods markets represent initial inputs to production, such as raw materials, as well as semi-manufactured products that will be passed on to other producers for completion and sale in the final goods market. The market relationships between businesses involved in the intermediate goods chain are, in most cases, direct and are often long-term.

Investment markets

Corporate finance can be obtained through investment capital (e.g. by means of share or bond issues). In their investment decisions investors seek the least possible risk and the highest possible yield. The yield of an investment is related to dividends and interest payments and also to gains in market value (capital gains). Since capital gains and dividends are uncertain *ex ante*, profitability has to be assessed on the basis of expectations. **Analysts** of banks and superannuation fund groups have an enormous influence on expectations in the market. They estimate the value of the business and make recommendations based on comparisons with share prices quoted on the stock exchange. Institutional **fund groups** act as large investors and often cultivate a long-term interest in a particular business.

Box 8.1 Markets of environmental interest

consumer goods. Final consumers are not passive receptors; their wants and needs can be changed by marketing, advertising and various forms of communication about the quality, function and value of the product. From an environmental perspective, this malleability of consumer demand is an important aspect that can be used to help promote a transition towards the sale of environmentally benign products.

Consumption is satisfied through the procurement of final consumer goods. Procurement is an active part of the value creation process for business. Consumers pay particular attention to the function, aesthetics and symbolism of the goods they acquire (see Liebl 1999: 132). Products acquired must be serviceable for the purposes of the consumer and so information about serviceability and functionality needs to be provided to consumers by business. Business has to provide a serviceable product to the consumer, but through the skilful use of marketing it may also

try to convince the consumer that the product on offer has all the functionality desired (see Kritzmöller 1999: 25) even when this is not the case. Often acquisitions do not meet all the needs of the consumer and a compromise has to be reached when a purchase is made. Once a product is perceived to be serviceable, then the chance of repeat buying is increased because of the certainty associated with actual experience gained about the functionality of a product—something that a product made by an alternative supplier may not be able to provide.

Procurement is not a discrete process (see Selle 1993). Consumers change their perception of the functions and uses of goods according to the stage reached in their lives and according to the memories (good and bad) associated with particular products. To some extent, therefore, consumers invent new functions for products (e.g. when a customer uses an antique household appliance as an ornament, or an ornament as a paper weight). Suppliers are not aware of all the functions for which their products will be used and so they provide guidance about the **functional**, **symbolic** and **aesthetic aspects** of a product. For example, an electric hairdryer is designed to dry hair, and a supplier will provide instructions about how to use the dryer to dry hair, such as the distance to hold the dryer from the head and so on; however, instructions will not be given about how to use a hairdryer as a makeshift blowtorch. The hairdryer is not serviceable for this purpose. Hence, consumption and communication are closely interrelated. There are a number of aspects to this link between consumption and communication (see Fig. 8.4).

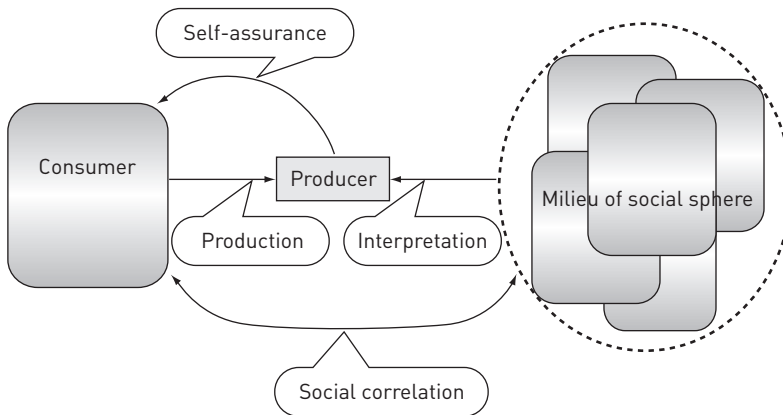


Figure 8.4 Self-assurance and social correlation during consumption

Source: Bredemeier *et al.* 1997

In the process of experiencing goods, consumers assure themselves about the qualities and functions of the products they have acquired. They look for **self-assurance**. This means that they seek to develop confidence that the products reflect the functions and purposes that have been communicated by the supplier and the functions that they themselves desire from the product. Purchase of a product links consumers to their social milieu. Actual purchase, when it occurs, discloses the consumer's tastes, income and ethical standards. The product acts as a link, or a

social correlation, between the consumer and the social **scene** in which the consumers find themselves. This scene can be represented as a local network of similar people in similar places and with similar lifestyles (Schulze 1996: 747). Examples include being part of an advanced civilisation, a group in a pub, people at work or people at a concert. Social correlation is a two-way relationship between the consumer and the social group that interprets the functions, serviceability and ethics of the consumer (see Brüggemann 1998). Thus, a fur coat is considered by some to be a luxury to be envied, whereas for others it is a symbol of animal torture and the person wearing it is rejected (see Kritzmöller 1999).

Milieus have a special significance in this social correlation. Schulze (1996: 463) defines milieus as ‘groups of people, who stand out from each other because of group-specific existence forms and because of enhanced inner communication’. Customers imitate one another because they assimilate characteristics of lifestyles and consumption traits that are marketed, including conscious avoidance of some unacceptable consumption patterns. Consumers learn their consumption patterns from family, friends, neighbours (see Brock 1995) and from the general culture and standard of living in their country. They learn indirectly through their observations of the social sphere.

In the process of value creation consumers and suppliers cross-reference each other. Consumers express their needs by making offers in the marketplace, and suppliers undertake market research about consumer likes and dislikes. Individual consumers and suppliers are invisible market partners in terms of the quantity demanded, the value of goods and services received and environmental impact added in the production-to-consumption process (see Fig. 8.5).

Suppliers create and supply consumer goods in the form of products and services that add corporate value and have an environmental impact—termed ‘environ-

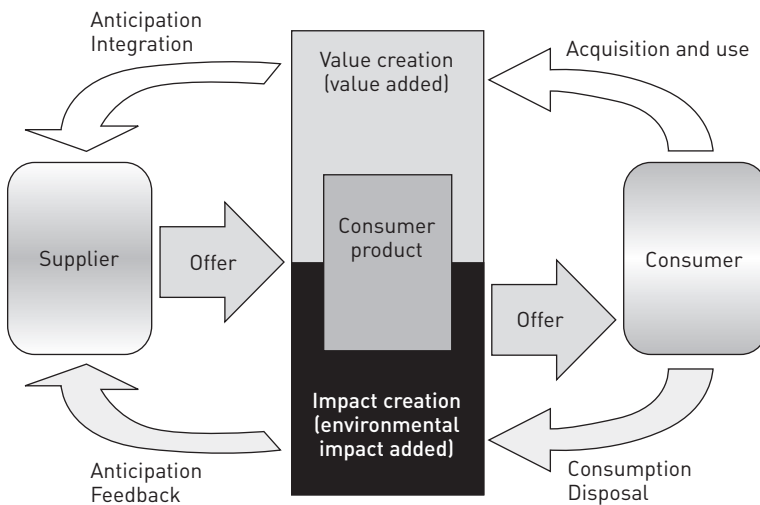


Figure 8.5 Processes of supplier and consumer value and environmental impact added

mental impact added'. The consumer confirms the value of the products through **acquisition** and **use**. In parallel with this, environmental impacts are added through **consumption** and **disposal**, which lead to emissions into the environment and eventual waste. In order to create more value for the customer the supplier **anticipates** the possible desires of consumers. By obtaining feedback from marketing questionnaires and by encouraging customer participation in the design of products and services, consumers are **integrated** into the research, development and design processes associated with new and improved products or services. For example, when a customer visits a hairdresser the supplier and customer interact in the initial decision about cutting, colouring and styling and also throughout the hairdressing experience.

In **eco-marketing**, in order to make the choice easier for the consumers, suppliers also anticipate the environmental impact added by consumption. Hence, the supplier directly influences the product or service and indirectly influences consumer behaviour where environmental issues are considered. This encourages the possibility of 'closing the loop' by taking waste from the final product or service and linking it back to the production process. Closure of the loop may occur directly by re-use of material inputs or components from the final product (e.g. re-use of computer parts in new computers) or indirectly by a transformation process that permits re-use for other purposes (e.g. as in paper or glass recycling).

An essential difference between consumers and suppliers is that suppliers carefully analyse consumer behaviour through market research in order to establish that they can identify and then market their goods or services to selected target groups; in contrast, consumers are not compelled to consider the behaviour of suppliers. Instead, it is assumed that suppliers will be keen to market their products by making consumers aware of all the benefits on offer (Schulze 1996: 444). Consumers are generally concerned about receiving functional and serviceable products and the availability of after-sales service.

Suppliers aim to differentiate their products from those of their competitors. Use of brand names is one way of keeping consumer demand tied to a particular product or supplier. Some suppliers deliberately do not use brand names—in fact, they sell their products as unbranded, or 'no-name', and tend to concentrate on having a lower price relative to those charged by competitors. However, sale of unbranded products becomes a branding of its own (e.g. with the sale of no-frills flights by airlines). Image is constructed in a similar way to that used by suppliers with brand names, through market relations designed to enhance communications between suppliers and customers (see Box 8.2).

8.4.2 Relationships between manufacturers and wholesale traders

Manufacturers compete to obtain the custom of people in the final goods market who have the economic resources to buy products on offer. They also have to compete with other manufacturers to get their products listed in trade catalogues, displayed on shelves or publicised by wholesale trading businesses. There may be a small number of wholesalers in an industry, such as food, and a large number of

The image of a supplier can be directed in different ways to different target audiences. For example, the image conveyed to a tax office collecting value added tax (VAT) or goods and services tax has a focus on the provision of accurate and correct statements. In contrast, the image presented to consumers needs to emphasise the quality and functionality of a product for a particular price. A desired image is developed and presented to each specific target group (see Faulstich 1992: 72ff.). For consumers, image is linked to **brands**. These represent the symbolic value of services and products and can be established through the goods themselves or through a **corporate image**.

Corporate image is designed to help promote sales of all products and services supplied. Consumers may not believe in the image being generated by a corporation, because other factors also have a bearing. For example, Shell petroleum may be associated with freedom, uninhibited driving and open-space lifestyles, or it could be seen as typified by the threat of Brent Spar being sunk in the North Atlantic, or social and political involvement with the Ogoni tribe in Nigeria. To some extent, consumers receive independent information about corporations, irrespective of the image generated by market relations (Avenarius 1995: 159).

Avenarius (1995) defines the construction of an image as a process involving reciprocal influences between the image supplier, the audience of that image and other people that may affect the audience's perception. Baskin and Aronoff (1988: 62) sum up the situation as follows:

An organisation's image is a composite of people's attitudes and beliefs about the organisation. Images cannot be communicated directly. They are built over time, developed through the cumulative effect of many messages. Such messages, which take many forms, are frequently not transmitted intentionally.

According to Faulstich [1992], by taking care of its image the corporation should create a background of trust that encourages sympathy for it, in its role as a supplier, and for the products it offers. If image does create credibility, barriers to the success of products that do have an environmental impact can be addressed and overcome. Target groups decide what aspects of image will be relevant. Of course, the supplier can find out whether an image is authentic only when the products are actually purchased and when feedback is available from the group of purchasers. Development of a dialogue with consumers does, then, help promote assessment of the reality of a particular image. With recent heightened concern about security from terrorist attacks, the background of trust becomes a critical consideration in supplier relationships.

Box 8.2 Image construction

manufacturers or agribusinesses that wish to sell their products to final consumers through wholesalers that 'break up the bulk' of the products they purchase. In 1995 in the German food trade the 10 biggest wholesale enterprises accounted for 79% of the final consumption market, and the 50 biggest enterprises accounted for 98% of total turnover (Kull 1998: 37). Trading groups such as Completefoodserves, Karstadt or Quelle provide a narrow gate for manufacturers to pass through on the way to the mass market. This can be described as a **gatekeeper function** of wholesalers (Hansen 1995: 349ff.). As gatekeepers, wholesalers have a special market power linking manufacturers and consumers, because they can choose the **assortment** of goods they will trade in and the form in which the goods will be presented to retailers. Wholesale trade also has a key function as an assembly point for packaging and disposal of old products (see Meffert and Kirchgeorg 1998: 206ff.). With this background it can be seen that environmental innovations can succeed or fail because of the actions of wholesalers.

As ‘middlemen’, traders are in a position to apply their influence on the environmental quality of products from both the supply side and the demand side of the market. On the one hand, they have the power to promote the products of environmentally progressive manufacturers, and they can choose to promote ‘green’ products to consumers (or retailers, who will then sell them on to final consumers) through sales promotions, advertisements and support for environmental brands such as organic food supplies (e.g. Naturkind; The Good Life Store Ltd). On the other hand, they can choose not to pursue ‘green’ product lines. Wholesaler power to choose can result in fundamental conflicts of interest between manufacturers and traders (see Berekoven 1995: 60ff.; Ceyp 1996: 32).

The wholesaler’s gatekeeper role involves the exercise of power over manufacturers through the restriction of trade in products that are unacceptable to the wholesaler’s image. Wholesalers are contracted to replace goods on the shelves of retailers and, if the product is not seen to have rapid turnover, even though it is ‘green’, the products will not be supported unless the margin is high enough. Space is at a premium on the shelves of retailers and needs constant replenishment in an efficient way—something the wholesaler is particularly well equipped to do, especially where just-in-time (JIT) purchasing is used, and which manufacturers of single product lines would find uneconomic in many cases because, as mentioned above, the wholesaler breaks up bulk supplies and then distributes them along with other supplies. Wholesalers can experiment with products. In this process, they examine how the retailer (and final consumer) react to changes on offer and whether demand is increased. Hence, they can test the attractiveness of new environmentally benign products and can remove them from sale if demand does not increase. If a recommended new product disappoints the quality expectations of consumers, the wholesaler also faces the risk of losing the customers for its complete range of goods. Furthermore, the success of environmental products can be problematic for the trade when alternative products to conventional articles in the range are provided and customers become aware of the disadvantages of those conventional articles.

In summary, wholesale trade supports consumption of environmentally benign goods (see Fig. 8.6):

- Through the flow of goods and materials provided in the range
- Through the flow of information, including consultation about the environmental advantages and disadvantages of products
- Through the flow of values and payments associated with economic added value gained from products that exhibit better environmental performance (i.e. having lower environmental impacts)

8.4.3 Relationships in the intermediate product market chain

Before goods reach the wholesale trade and consumers, materials and intermediate products go through multiple transformation processes to emerge as goods that can be sold for final consumption. Organisations often rely on purchases of raw materials from other organisations, or they may be vertically integrated such that they produce their own raw materials as well as transforming these into intermediate or

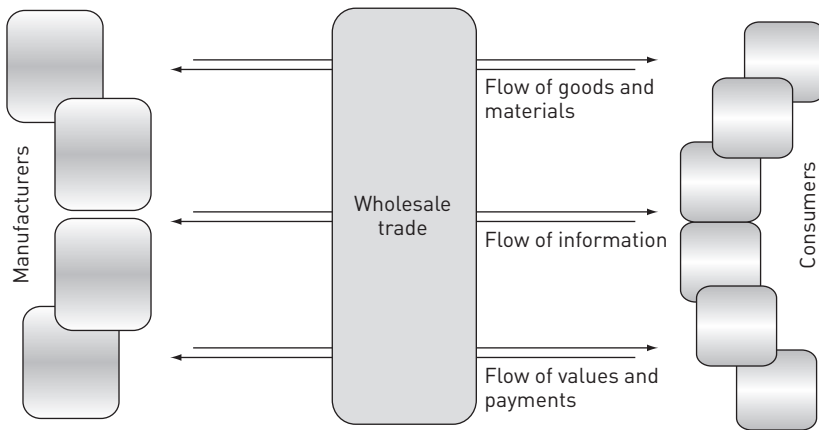


Figure 8.6 Three flows of wholesale trade

Source: Kull 1998

finished products. For example, in agriculture the food produced may be sold to a processor, or value may be added in the agribusiness itself by processing the food further (e.g. by canning or bottling it).

The reduction of environmental impact added all along these supply chains is an essential task for environmentally oriented business management. In addition, **closing the chain** is an important aspect in value creation for the business (see Kirchgeorg 1998). This can be illustrated through a model of the chain of value creation for textiles (see Fig. 8.7). Key positions in the intermediate product markets are generally occupied by agriculture, forestry, the chemical industry, transport, companies involved in the recovery and extraction of mineral resources, and the biotechnology sector. Organisations producing intermediate products and consumers of final products need information about the environmental impacts created in the earlier stages of production if they are to take environmentally benign decisions about the stage of product development, production and re-use for which they are responsible (i.e. the aspects of production that they can control). As Spiller (1999: 25) argues:

In the cultivation of cotton, transparency during all stages in the value chain, from the production of chemicals for application in the field to manufacturing, transport and trade is complex. Often the producers themselves do not know anything about the environmental effects of the production process in the intermediate product stages.

Therefore, for the enhancement of eco-efficiency, corporate supply-chain management adopts the task of improving the recording of information about sources of environmental impact throughout all stages of the value chain. Relationships with suppliers and receivers into storage are included in general business substance chain management. Suppliers of raw materials are included in environmental networking, because raw materials such as cereals, cotton, wood and metal are produced as homogeneous products in tough competitive conditions at global market prices.

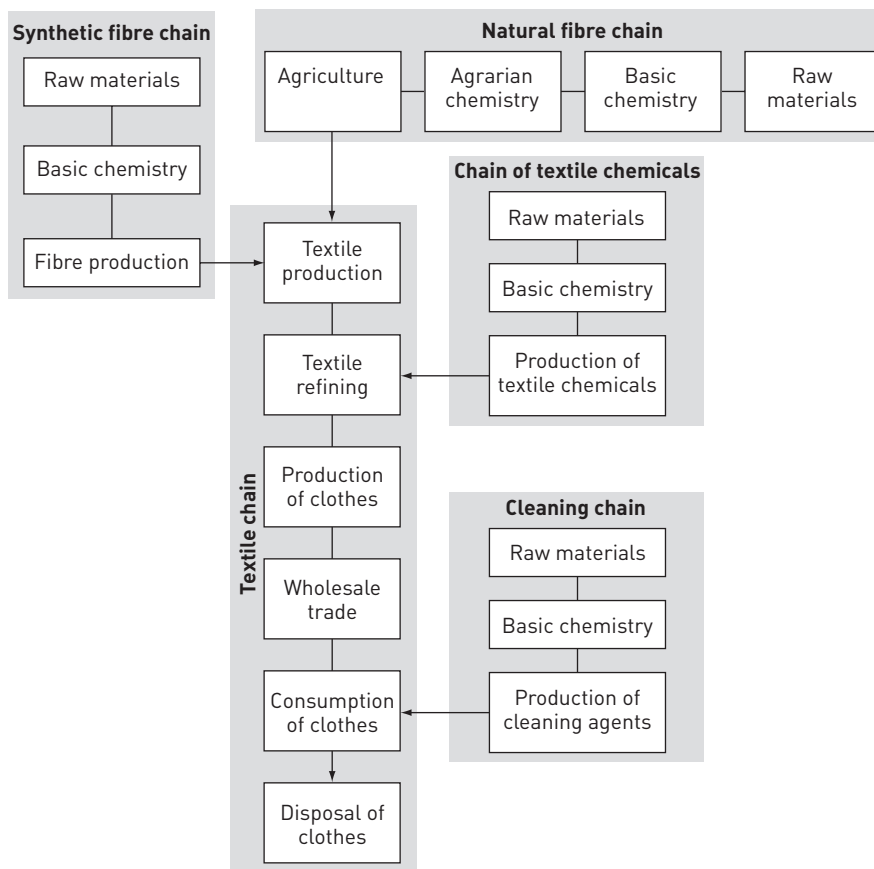


Figure 8.7 Environmental problems in the textiles value creation chain

Source: Spiller 1999: 26, with reference to Hummel 1997

Environmental differentiation is a useful strategy for suppliers to follow when advantageous environmental performance is maintained or built up and communicated to the final purchasers. Substance chain management aims towards the introduction of voluntary standards for self-regulation and co-operation between participants in order to guarantee the truthfulness of the environmental claims that are made.

8.4.3.1 Tasks of substance chain management

Integrated substance chain management is a decision-support tool in which the life-cycle approach is combined with economic considerations in order to analyse and reduce the overall environmental impacts of substance chains (VNCI 1991). The method focuses on (potential) actions but questions such as ‘What is the total effect of substance A on the environment?’ are not answered within the framework. Instead

the 80/20 rule is applied ('What 20% of elements account for 80% of the total?') in order to answer action-oriented questions such as 'What would be the environmental and economic impact of installing a recycling system for substance A?' In conceptual terms, the environmental part of the method is thus very similar to a simplified life-cycle assessment (see www.dk-teknik.dk/ydelsers/miljo/LCA%20guide/3rd_ed/loop2212.htm).

The aim is to obtain a clearly defined use for a product with the lowest price possible through co-operation with other companies involved in the value chain. For example, a sports centre, such as the Australian Institute of Sport, arranges fitness programmes and associated experiences that require a combination of services and products—from floor polish for the centre to the muesli (or cereals) eaten by health-conscious participants. Manufacturers (suppliers) of these products have clear preferences about the constituents of their products. Intermediate products for sports centres, such as bulk purchases of muesli, can be identical to final consumer goods. Muesli is offered in intermediate and final product markets and, in terms of its ingredients from one supplier to another, is fairly homogeneous. However, in the field of gastronomy and leisure, muesli may be packaged in larger quantities for the **convenience** of bulk usage. Hence, business-to-business trade can clearly be distinguished from sale to consumers. With business, fewer buyers acquire far larger volumes and consequently relationships between suppliers and customers are much closer. In the supply business—for example, for automobile parts—business-to-business trade is very important in many countries. Businesses buying intermediate products directly influence the price, quality and functionality of the product supplied and expect customer-specific products and services to be supplied through long-term business relationships (see Backhaus 1997: 641ff.).

Formation of these business-to-business relationships leads to two important questions (see Fig. 8.8). These are: 'What is the substance of the business-to-business transaction?' and 'How will the transactions be co-ordinated?'

Specification of the products being traded is identified through a set of **performance requirements**. This set includes related activities such as installation, financing, insurance and, where necessary, arrangements for product return. Suppliers may agree to lease out their products rather than sell them. For example, intermediate metal-based products, such as aircraft, can be leased to business, with the supplier taking over responsibility for disposal (e.g. through dismantling of the aircraft) by building such costs into the lease rentals. Also, carpet leasing has been introduced by Interface (www.peopleandplanet.net). **Business integration** addresses the functions that are associated with business-to-business trade. These might include the information system, agreements, transport and logistics, pre-sales and after-sales customer care and management of the co-operative relationship.

When several enterprises enter into mutual relationships (e.g. alliances) with each other, management of the interrelationship between that larger number of parties is more complicated. Expansion of parties may occur because more businesses are involved at different stages of the value chain or because more businesses get together at each stage of the chain, perhaps encouraged by an industry association. The impacts of such arrangements on the environment can be directly addressed in substance chain management. For example, before a piece of clothing is cut and sewn in a textile factory considerable environmental impacts occur. In cotton

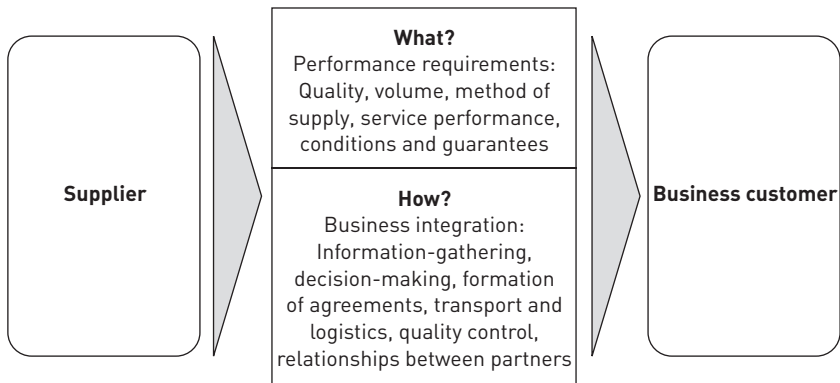


Figure 8.8 The 'What?' and the 'How?' of business-to-business relationships

Source: based on Schneidewind 2000

growing, fertilisers may be used, polluting water supplies. In the dyeing process, chemical dyes may be used for colouring and protection, again leading to water pollution; and in the transportation of the textiles there may be a resultant reduction in air quality. Substance chain management, with its focus on life-cycle assessment, encourages an holistic approach to the resolution and continual improvement of environmental problems. It is an ideal mechanism for addressing environmental problems throughout the value chain while maintaining competition between the different parties. An alternative is for the environmental problems to be internalised in a single business, through **vertical integration**. However, vertical integration reduces the extent of competition as each stage of the business tends to get locked in to producing for the next stage.

Substance chain management facilitates the inclusion of environmental considerations and the production of environmentally benign products (see Schneidewind and Petersen 2000). In the following section the co-ordination tasks associated with environmental performance chains are examined.

8.4.3.2 Intermediate product markets as environmental performance chains

For the best environmental results businesses will introduce substance-chain management when considering demand for intermediate products from suppliers. Critical to this development is the inclusion of a suitable flow of information that complements the material flow of goods and the flow of funds in the value creation chain. The environmental quality of materials used in the previous and following performance stages needs to be enhanced and a reduction in usage encouraged. Apart from this, values, information and materials need to be transported through a **counter-flow** in order to channel them back into the value creation cycle.

The importance of, as well as the problems associated with, development of an integrated environmental information system for substance-chain management has increased in recent years. Difficulties arise with (see Schneidewind and Petersen 2000):

- An increase in the variety of materials
- The need to balance the environmental effects
- Concentration on core competences
- Missing communication structures

Variety of materials

The variety of materials available for incorporation into new products has increased considerably. Numerous innovations have occurred in the development of materials, with the addition of new synthetic materials, composite materials, colours and pigments, additives and so on. This additional variety increases the complexity of information stored and the need for electronic recording of data.

Balancing the environmental effects

Apart from factoring in the direct environmental impacts created by the production of intermediate products, different environmental consequences of these impacts have also to be weighed against each other. For example, a composite material may make recycling difficult when the product is finished with, but it can make a considerable contribution to the reduction of environmental discharges while the product is being used (e.g. entailing lower energy consumption, better durability and lower servicing requirements). The same argument holds for a protective coating that contains an environmentally questionable chemical but which also prolongs the life of the product that has been protected.

Concentration on core competences

Businesses increasingly concentrate on their **core competences**. A growing number of peripheral activities are contracted out to suppliers of intermediate goods and services through **outsourcing**. This leads to further division of work associated with various stages in the value chain. With the introduction of outsourcing, control of the flow of information is shifted from internal departments to external businesses. Also, internal payments to departmental and divisional heads are replaced by contractual arrangements with external parties. Although this process imposes a greater distance between each link in the value chain, as the costs and benefits of contractual relationships need to be more clearly spelled out, the flow of information can be improved to compensate. When environmental issues are involved (e.g. in green purchasing contracts with suppliers), process and product specifications are included in the contractual arrangements. Of course, outsourcing leads to less direct control and greater indirect control through the law courts if things go wrong with operations.

In order to limit the costs of co-ordinating outsourcing activities, businesses increasingly are limiting themselves to working with as few suppliers as possible. These suppliers consider their basic competence to be the effective and efficient co-ordination and supply of intermediate product flows. For example, suppliers to the automobile industry supply completed electronic modules with recyclable parts, and the agrichemical industry has begun to exclude active substances from products provided to intermediate businesses. In this way suppliers, as important sources of

information, can play a key role in resolving critical environmental problems through business-to-business trade.

Missing communication structures

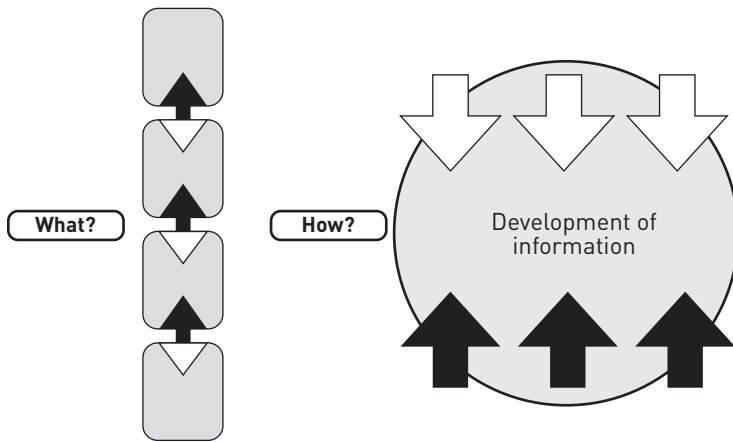
The supplier communication structures necessary for weighing up the environmental impacts tend to be limited. Only rarely are suppliers in a position to weigh up the full environmental impacts of their intermediate products. In many cases, structures that allow the evaluation of environmental impacts over the whole environmental impact added chain are completely missing. The presence of a supportive communications structure depends on whether business-to-business trade is conducted in industrial, newly industrialising or developing countries. Where business-to-business transactions occur between these three types of country, the need to develop a strategy for global sourcing and to consider environmental impacts assumes greater significance. Modern information technologies enable networking between countries, but they give no real insight into the ecological and social production conditions of the supplier; hence the need to develop and enforce environmentally oriented communication structures is important.

Three focal points provide the basis for a solution to the problem (see Fig. 8.9):

- **Downstreaming.** In parallel with the development of co-operation with suppliers, pressure can be placed on suppliers in order to get them to introduce and maintain improving environmental standards in relation to material flows between suppliers and producers.
- **Upstreaming.** Environmentally benign intermediate products can be used to gain a competitive advantage for the producer by generating an aura of improved legitimacy and transparency in the eyes of direct consumers at the end of the value chain (e.g. in the case of clean waste-disposal systems).
- **Development of information.** By holding contracting parties in the value chain to agreed environmental standards, one can increase the importance given to the introduction of systems for gathering and classifying environmental information and to making that information transparent.

Downstreaming and upstreaming refer to ‘what’ is going to be co-ordinated, whereas development of information addresses the question of ‘how’ co-ordination is to take place. Co-ordination between parties involved in intermediate product markets encourages **integrated solutions** to environmental problems. From this perspective, products supplied are viewed as sets of functions that customers value rather than as material products. Emphasis on the functions provided by products helps with the development of a focus on components and services that lead to a resolution of environmental concerns.

To improve communication structures with suppliers, businesses fall back on co-ordination methods such as partnerships and strategic alliances. Both of these co-ordination methods take commerce well beyond the simple transfer of goods and services in the marketplace. Sometimes, an obligatory **standard** for these relationships is determined by government beforehand; alternatively, a **platform for co-operation** between the parties may be constructed in order to make it easier for environmental information about products to be transferred.



White arrows = downstreaming; black arrows = upstreaming

Figure 8.9 Focal points for ecological attention in the environmental impact added chain

The introduction of standards presupposes a willingness to comply, or an incentive system that encourages compliance, by business. For example, one incentive is that the product may receive a **product passport** that describes where materials relating to the product have come from, the processes through which it has been transformed and the criteria with which the product complies. These are sometimes used as a basis for obtaining **eco-labels** that certify the truthfulness of a product's claim to be environmentally benign. Another consideration is the **audit** of all production sites through the whole value chain. This can be part of the eco-labelling, or **certification**, process. Labelling or certification organisations also have to be audited. The effectiveness of these instruments—for example, the product passport—depends on whether businesses at the very end of the value chain (e.g. mail-order firms) demand the application of appropriate standards when dealing with their suppliers. The absence of such standards and certification organisations has stirred some businesses to get together to develop their own standards. For example, the certification norm SA 8000 (CEP 1997; www.bsdglobal.com/tools/systems_sa.asp), addressing social accountability aspects of production standards, is promoted by a number of companies and organisations from a range of industry sectors. It has its own certification agency—Social Accountability International (www.cepaa.org). The ‘“Better” & “Best”’ label for natural textiles (www.naturtextil.com/indexblau.ssi) and the Forest Stewardship Council (FSC) certificate for wood products (www.fscoax.org) arose from projects developed by committed businesses. For example, the FSC consists of an association between members from a diverse range of environmental and social groups, the timber trade and the forestry profession, indigenous peoples' organisations, community forestry groups and forest product certification organisations.

Co-operation platforms established in the chain of intermediate products have additional roles. For example, in the TexWeb project⁶ an intra-corporate and inter-corporate information network is constructed along the textile chain. The network is designed to create transparency in material flows (thus addressing accountability) and to motivate innovation to reduce the use of materials (addressing eco-efficiency concerns). In the USA, co-operation between power companies and service providers is growing. For example, H Power Corporation installed a 4.5 kW fuel cell system at Yellowstone National Park. The propane-fuelled system provides power to ticket kiosks and to an office at the west entrance to the park; the waste heat from the system will be used for space heating. Downstream mail-order firms such as Hess Natur (www.hess-natur.com) and Otto (www.neu.otto.de) co-operate with enterprises in the textile industry as well as with plantation owners in order to secure the purchase of cotton for their own eco-collections. Remei AG Switzerland (www.remei.ch) has found solutions in both directions, upstream and downstream. As a cotton trader in India it constructed a network of co-operation with spinning mills and it meets demand for high-environmental-quality, low-cost cotton (www.umwelt.de).

The integration of electronic data interchange (EDI) between the partners through the value chain is an important part of the network of co-operation. In particular, data exchange over efficient consumer response (ECR) concepts⁷ and business-to-business platforms is representative of the networking of technical information through co-operation platforms. In the following two subsections, greater detail on these concepts is provided.

8.4.3.3 End-of-pipe and integrated environmental technologies

Two considerations are worth observing about the environmental context of intermediate goods supplies—the development of end-of-pipe solutions and integrated environmental technologies. The market for environmental technology developed strongly during the 1970s because of the introduction of environmental laws to protect against the **output** of emissions, noise, sewerage and soil degradation. New environmental laws served as a catalyst for the modernisation of existing production processes and facilities so that environmental impacts could be reduced. Additional methods such as filters, sewerage plants and barriers to exclude noise have the advantage of being able to reduce environmental impacts with relatively low investment expenditure. These methods are called **end-of-pipe** environmental protection measures. Retention of existing corporate production processes is not possible in these circumstances if the company wishes to survive. End-of-pipe investment costs must be incurred in order to comply with legislation. Hence, legal constraints cause investment expenditure that does not necessarily lead either to cost savings or to improved product quality. On the contrary, let us take the example of electric filters. These require additional energy use and disposal of filter dust, thereby increasing business costs and reducing business profitability. Business then needs to consider whether costs could be reduced if production facilities were moved to different legal

6 To which, among others, the button manufacturer Günther (www.guentherbuttons.de) and the printer Mülforter (www.mulforter.com) are connected.

7 For background information on the ECR concept, see www.fmi.org/media/bg/ecr1.htm.

jurisdictions with looser technical specifications for addressing environmental pollution.

Since the 1980s end-of-pipe methods have been replaced with or supplemented by integrated environmental protection methods of production. Environmental impacts are taken into account before the construction of new facilities and processes. Integrated technologies encourage the use of reduced quantities of **inputs** in the production process. Likewise, improved profitability is combined with reduced environmental impacts. Hence, reduced consumption of resources, waste emissions and physical depreciation of plant and equipment mean that integrated technologies for environmental protection also lead to economic advantages and an improved competitive situation. The need for expensive disposal of waste and harmful materials is avoided because they do not exist if environmentally benign integrated technologies are introduced with a 'zero-waste' frame of reference (see Holzbaur *et al.* 1996: 269; Schaltegger and Figge 1997). The market for integrated environmental methods is encouraged through legalistic and economic means. With use of these initiatives, innovation through research, development and design for environment is encouraged. From this perspective, the government's role is no longer to establish laws for imposing minimum environmental standards; instead, it is to define clear, ambitious goals for environmental protection so that businesses can determine for themselves the most innovative solutions to environmental problems while improving their profitability and seeking a competitive advantage.

8.4.3.4 Leasing

For an owner, each time production is changed through the introduction of innovative processes additional risks (e.g. technical and economic obsolescence) are incurred and capital is tied up. In order to minimise such risks and to tie up less capital, machines, vehicles and facilities are often leased by businesses. Leasing decouples use of the product from ownership of the product. It passes the risks of ownership to the lessor, who leases the asset out to the lessee. From an environmental point of view, there can be advantages to leasing: for example, with the leasing of intermediate products. The leasing of computers (e.g. by Peacock, www.peacock.de) or of photocopiers (e.g. by Xerox, www.xerox.com) becomes much more attractive to the lessor when the equipment can be leased for long periods of time, does not require much maintenance, is easily repaired and can be dissected in modules when repairs are required or if parts can be re-used when the equipment reaches the end of its useful life. Leasing encourages innovations in these directions. Innovations that reduce the consumption of materials are also encouraged as a reduction in the variable costs of leasing make the leased products more competitive. If the lease rental is related to the function rather than the ownership of the appliance there is a stronger incentive to provide innovations that improve the function for customers. For example, in the case of photocopiers, the need to increase the number of pages copied per minute may lead to improved toner processes being developed. Responsibility for the actual product, including reduce, re-use and recycle decisions, remains with the manufacturer, whereas the services (or functions) generated by the leased equipment are provided to the lessee (the user). The strength of leasing, in encouraging environmentally benign value crea-

tion, tends to be through the focus of the lessor on improving the provision of services such as maintenance, up-to-date technology, rebuilding and so on, to gain an advantage over the competition.

8.4.4 Relationships between capital providers and businesses

Banks, insurance companies and superannuation (pension) funds create value for their members by financing the permanent and working capital of their customers. Great interest is being expressed by financiers—the providers of capital to business—in the environmental impacts of business activities for which funds are provided. Financial markets regulate the availability and the price of these scarce sources of funds. The focus is predominantly on expected future opportunities rather than on past performance. In the investment markets in particular the success of environmentally oriented business management is measured less in relation to work already performed than in relation to expectations of good future performance. To compete for finance, businesses need to persuade potential providers of capital about the economic **prospects of success** and the **security** associated with any financial commitment to be made.

In the investment markets negotiations take place over future expectations and over future risks. Access to financial flows determines the production processes, regions and products that capital can be invested in and the conditions under which investments will be made. In this sense, financial actors control the future formation of the economy (see Schaltegger and Figge 1999a; Schmidheiny and Zorraquin 1996). Business management can influence this future and move capital towards projects that have sustainable outcomes, when they can demonstrate attractive monetary yields and calculable risks. Consideration of yields is very much to the fore in the investment market, although market for credit is suppressed by risk considerations, including environmental risks and liabilities associated with these risks (see Fig. 8.10).

However, investment and credit markets cannot be considered in isolation. Together they comprise the capital market and provide external financing through private and foreign capital. When private capital is increased the creditworthiness of the business is also enhanced because of the strengthened capital base. Banks presuppose that private capital will comprise a set proportion, say 40%, of the total capital base. As an alternative to external financing, internal financing is also available to businesses through periodic income being retained and through net cash inflows, which are related to yields, withdrawals and depreciations. The expectation of an increasing cash flow enhances the attraction of the enterprise to new issues of capital.

8.4.4.1 The attraction of environmental protection to the capital market

The value of the enterprise in the capital market is called **shareholder value**. Low risk of business failure and increasing profitability attract capital providers. In addition, positive net cash inflows from investments and satisfactory liquidity also enhance shareholder value.

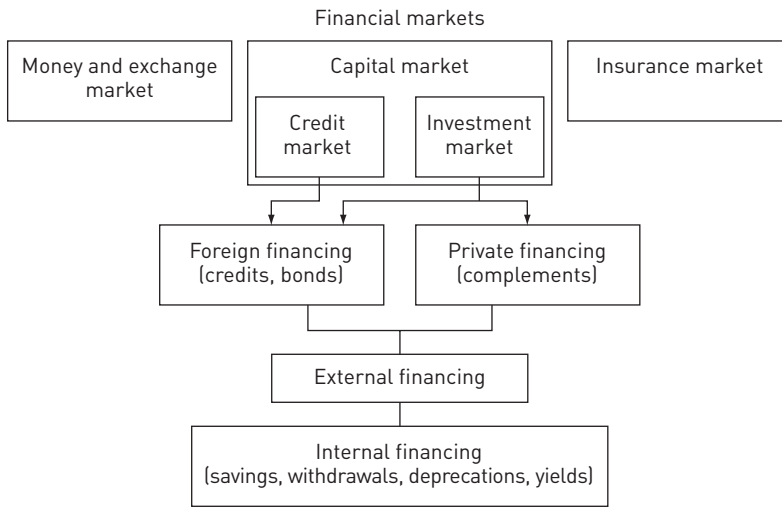


Figure 8.10 Financial markets and forms of financing

Measures to protect the environment can enhance shareholder value only when they contribute to net cash inflows: for example, by reducing the risk of cash outflows or by improving yields (see Schaltegger and Figge 1997). Eco-efficient improvements increase the worth of the business to shareholders because such improvements require monetary gains to be realised from environmental investments. The environmental performance of a business is of interest to financial analysts in banks and insurance companies when it is linked with economic success.

Financial institutions are beginning to realise that they need to assess the environmental performance of the companies they plan to invest in (e.g. to ensure that there are no surprise environmental risks that could ruin the cash inflows of their customers if fines or environmental penalties were imposed). In these circumstances, financial institutions and the analysts working for them are beginning to assume an increasingly important role in the promotion of environmental performance evaluation and in the associated accounting information and reporting systems. In Germany, for example, oekom AG (www.oekom.de) evaluates the potential environmental performance of businesses from a financial economics perspective and makes investment recommendations based on these evaluations. This is equally important in the services sector. For example, in Australia, investment products can be sold to customers only if a product disclosure statement is made—one that must state the extent that environmental considerations are taken into account in the selection, retention or realisation of the investment (Burritt 2002b). Encouraged by the United Nations Environment Programme (UNEP) finance initiatives, bankers and insurance companies are beginning to familiarise themselves with the risks and rewards from environmental performance evaluations.

8.4.4.2 Environmental shareholder value

The link between environmental performance and financial performance has been heavily discussed for many years (EIRIS 1989; Feldman *et al.* 1997; Klassen and McLaughlin 1996; Li and McConomy 1999; McGuire *et al.* 1981; Schaltegger and Figge 1997; Schaltegger and Synnestvedt 2002; Spicer 1978; Wagner *et al.* 2002). Likewise, in recent years, the concept of shareholder value has become increasingly popular as a basis for valuation of companies and financial assets (see Box 8.3). With the growing importance of environmental costs and with many companies earning money from environmental products and services, the question arises as to whether environmental management geared towards eco-efficiency is in conflict or in harmony with the philosophy of shareholder value (see Schaltegger and Figge 1997).

Shareholder value is a conventional investment calculation used to assess financial assets (particularly shares in companies). In technical terms, shareholder value, SHV , is the discounted net current value of a company's future free cash flows (Copeland *et al.* 1993, 72ff.; Rappaport 1986):

$$SHV = \sum_{n=1}^{\infty} \left[\frac{F_n^{\text{cash}}}{(1+i)^n} \right] - V^{\text{bcap}} \quad [8.3]$$

where F_n^{cash} is the free cash flow for period n , i is the discount rate and V^{bcap} is the market value of borrowed capital.

The concept of shareholder value depends on expected free cash flow (F^{cash}), since only this can be used to pay investors. Corporate value, CV , is determined by discounting the expected free cash flow:

$$CV = \sum_{n=1}^{\infty} \frac{F_n^{\text{cash}}}{(1+i)^n} \quad [8.4]$$

To arrive at the shareholder value, the value that is of benefit to shareholders (i.e. increased share prices plus dividends), borrowed capital has to be subtracted from corporate value. Unlike free cash flow, a simple income figure does not take into account the fact that a part of a company's income has to be used for paying interest on borrowed capital, thereby reducing the amount that is available to pay shareholders.

Box 8.3 Basics of the shareholder value approach

In this section, a short assessment of the shareholder value approach to environmental management is given (for an in-depth discussion, see Schaltegger and Burritt 2000). The impact of corporate environmental protection measures on the drivers of shareholder value will be analysed and conflicting effects will be weighed against each other. It should be emphasised that investigation of the effects of environmental management on shareholder value is just one element in a corporate shareholder value analysis.

Among the main advantages of the shareholder value approach is the fact that cash flow figures reflect basic inflows and outflows of cash and thus cannot be manipulated as easily by accounting practices and standards as income based on

accrual accounting figures (Copeland *et al.* 1993). Compared with income figures used in financial accounting, shareholder value has a major advantage when it comes to environmental management: it is future-oriented and focused on long-term increases in company value. Like most environmental protection measures, shareholder value is concerned with investment now in order to derive future benefits.

The shareholder value approach does not explicitly embrace environmental objectives but, with its focus on economic variables, it has a strong, direct influence on business activities and thus an indirect influence on corporate environmental impact. The anticipatory nature of the shareholder value philosophy—particularly its orientation towards the future and its emphasis on sustainable value increases—has more in common with the principles behind eco-efficiency than those behind conventional financial accounting, which is based on past transactions, events and standards, looking at historical costs rather than market values.

However, the philosophy behind the shareholder value concept also faces major problems. For example, the expectations of investors and management play a significant role in determining applicable discount rates and estimated future cash flows. If these expectations are poor predictors of the future (e.g. because of the neglect of future financial impacts resulting from existing environmental contamination), calculations will not correspond to the ideal shareholder value. Furthermore, values created in the distant future will often not be considered. This is because analysis of future trends is restricted to a period of 5–10 years ahead, because of the reductionary effects caused by discounting cash flows. In these circumstances, there is a danger of inappropriate management and investment decisions being made. Thus, given the inherent problems related to the shareholder value concept, the quality of the assessment of company value will depend more on the skills and expertise of the assessor than on the choice of assessment method. Nevertheless, in modern business practice, the concept of shareholder value has gained a great deal of support (see e.g. Volkart 1995).

Environmental management has various influences on shareholder value. To answer the question of how far a corporate environmental management system is in conflict or harmony with the shareholder value philosophy, a brief look at the underlying philosophy will be necessary. One way to approach the issue is to discuss the conclusions that can be drawn about corporate environmental management from a shareholder value approach. This can be undertaken by considering the drivers of shareholder value. With its strict emphasis on efficiency, the shareholder value concept is basically more conducive to economically efficient environmental protection, characterised by the fact that desired protection of the environment is achieved at minimum cost, or with cost savings or additional profits. This is in line with the purpose of improving eco-efficiency.

According to Rappaport's thesis (1986), management measures can be assessed on the basis of value drivers and management decisions related to investment, operational management and financing (see Fig. 8.11). The value drivers behind changes in shareholder value include:

- Investments in fixed assets
- Investments in current assets

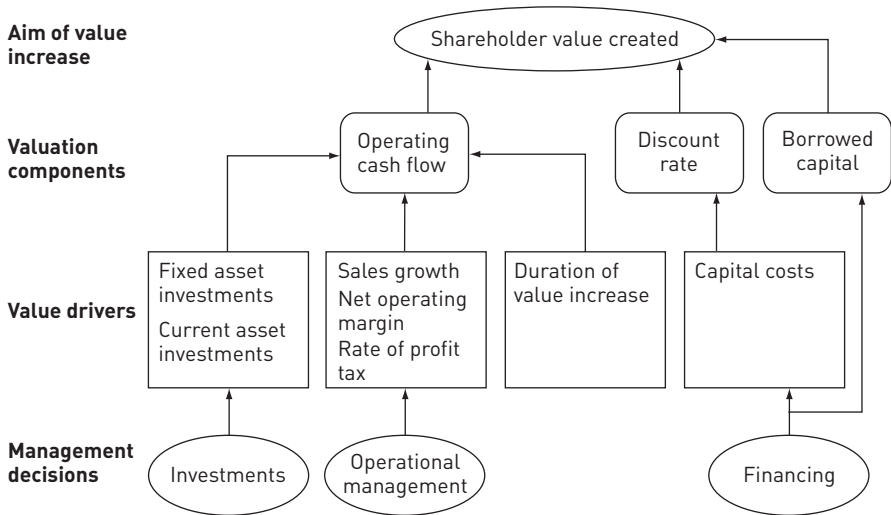


Figure 8.11 Drivers of shareholder value

Source: based on Rappaport 1986: 79

- Sales revenue growth
- Net operating margin and rate of tax on income
- Capital costs
- Duration of value increase

Value drivers are affected by environmental interventions to differing degrees, depending on the nature and size of the company. Environment-related investments include effluent treatment plants (fixed assets) as well as necessary working supplies such as chemicals used to neutralise acids (current assets).

Sales revenue growth and net operating margins may be affected, for example, by 'green' product lines. Duration of any increase in value is determined by asking how long a return that is better than the market average can be sustained (Rappaport 1986). In contrast to these value drivers, capital costs do not affect the valuation of cash flows but do affect the discount rate.

Obviously, the shareholder value approach does not take a positive view of every act of environmental management, only of measures enhancing enterprise value in the long run. Thus measures to improve eco-efficiency (Schaltegger and Figge 1997):

- Are capital-extensive, relating to software rather than hardware (involving 'smarter', smaller, cheaper installations)
- Consume low amounts of material, reducing throughput (through lower purchase, storage and depreciation costs)

- Are sales-boosting, increasing the benefit and attraction to customers (through the provision of more desirable products and services for more customers)
- Are margin-widening, increasing the benefit to customers and reducing the costs of producing products and services (fetching higher prices because of the greater benefit and involving lower operating costs through improved operating efficiency)
- Safeguard the flow of finance, gaining the confidence of the capital market (involving lower and more unsystematic risks and ‘winning’ a ‘green bonus’)
- Enhance value over the long term in anticipation of future costs and earnings potential

By incorporating the shareholder value concept into the formulation of corporate environmental management, it is possible to integrate the relevant parameters on which an economic decision is based into a single measure.

When assessing the cash inflow and cash outflow generated by alternative proposals, it is necessary to take account of the impact on different value drivers: that is, on three parameters (see Fig. 8.12):

- Expected additional cash outflow caused by the net investment
- Necessary additional net cash inflow from operational activity
- Expected additional risk

If, for example, management bases its decisions solely on expected income, it risks making an investment that may promise the highest return in absolute terms but

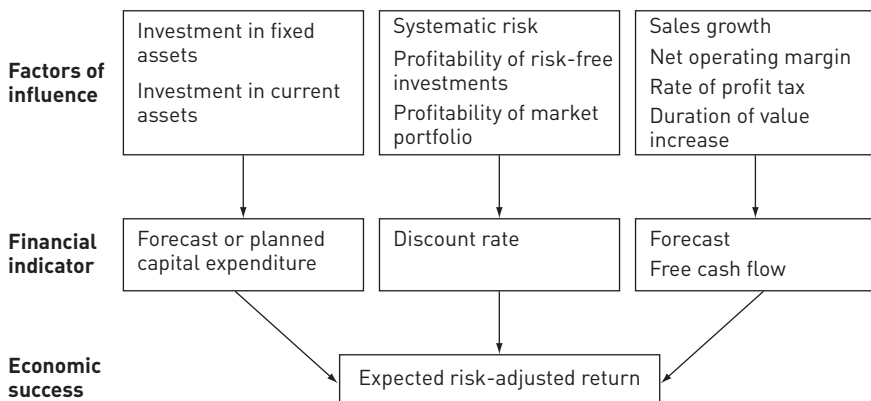


Figure 8.12 Integrated financial evaluation of environmental management

Source: Schaltegger and Figge 1998: 19

only a low return relative to the required capital investment, thus delivering only a poor return. In addition, it is possible that an investment will involve not only a high return but also a high risk that may not be adequately compensated by the return.

Additional enterprise value is determined not so much by the absolute additional income but by the relative additional return after adjustment is made to take into account anticipated risk. In this way, the shareholder value concept offers an *ex ante* valuation method for the implicit integration of the relevant parameters on which economic decisions are based.

To sum up, it may be said that a system of environmental management geared to increasing shareholder value provides a way in which the financial impact of environmental management can be assessed on the basis of the value drivers. At the same time, it provides a way of quantitatively assessing conflicting financial effects on an *ex ante* basis and weighing them against each other. In conclusion, a system of environmental management that enhances shareholder value is essentially in harmony with a market-oriented environmental policy and the concept of eco-efficiency. However, it is constrained by what the legal, political and market circumstances will allow and by what other stakeholders demand.

Within the context of corporate environmental management, the shareholder value concept faces certain economic and social hurdles. In addition to the fact that financial liquidity is not explicitly included in the calculation of shareholder value, problems may also arise wherever and whenever a company is unable to avoid certain risks through diversification—because of its size, perhaps. As investors can diversify their investments, unsystematic environment-related risks are not considered in the calculation of the discount factor. Nevertheless, these risks can be relevant for management if they cannot be balanced internally and if they influence the economic success of the company or perceived environmental credibility of environmental management.

The shareholder value concept takes only market risks into account. However, companies are also exposed to the risks of a possible loss of social acceptance and of legitimacy (Cowe 1994; Gray *et al.* 1996; O'Donovan 1999; Schaltegger and Sturm 1994; Schaltegger 2000). In this regard, the fact that the concept does not support any explicit analysis of the social aspects of corporate environmental protection and of corporate learning processes can be regarded as a significant shortcoming. In particular, the shareholder value approach stands in the way of the concept of sustainable development if it is used to argue for a redistribution of resources between social and environmental interests on the one hand and the interests of capital providers on the other.

If company management wishes to succeed in the marketplace and in society, it must safeguard its legitimacy. This may mean refraining from courses of action that, according to a purely arithmetic analysis, would lead to the biggest increase in shareholder value. Even from a strictly economic viewpoint it is necessary, therefore, not only to consider the net present value of free cash flows but also any option value of being able to remain in business (see Brealey and Meyers 1991; Dixit and Pindyck 1993; Figge 2001; Schaltegger and Burritt 2000: 143).

Questions for review

- 8.1 'Products can be seen as groups of functions; for example, a lipstick needs to deliver the product to the mouth, to keep the user clean, to be smooth rather than brittle, to be safe for human use and to retract when the lipstick has been applied. Each of these functions of the product can be improved by reducing its environmental impact added.' Based on the notion of a value chain, suggest ways for improving on the environmental impact added of a lipstick. Is there a better, alternative design? Can waste be eliminated?
- 8.2 Comment on the view that an improvement in eco-efficiency represents economically successful business management.
- 8.3 'If market failures are permitted in a society, then this is the fault of government.' What is market failure? What is an externality? Provide an example. Is the government responsible for removing externalities? How do you think this might be done?
- 8.4 Under what conditions might business include the costs of externalities caused by its products in the market price of those products? In your answer identify the spheres of influence involved.
- 8.5 What is information asymmetry? Why is information asymmetry important for a customer trying to find out about the environmental credibility of experience goods, trust goods and potemkin goods, but not trying to find out about search goods? How might eco-labels help? Provide an example.
- 8.6 Explain the difference between capital goods, intermediate goods, consumer goods and investment goods. Provide one example of each.
- 8.7 Why are wholesalers an important link in the process of 'greening' products?
- 8.8 What are supply-chain management and substance-chain management? Do they differ? Do they give rise to different information needs?
- 8.9 What are the main difficulties in providing an integrated environmental information system as the basis for substance-chain management?
- 8.10 'The leasing of intermediate products separates use from ownership and provides an incentive for manufacturers to reduce environmental risks associated with their products.' Comment on this view.
- 8.11 What is shareholder value? Explain whether—and, if so, why—shareholders might be interested in the environmental management of business. What is the connection between shareholder value and eco-efficiency?