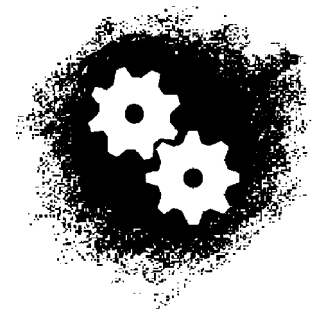


BEYOND THE BUSINESS CASE FOR CORPORATE SUSTAINABILITY



Thomas Dyllick¹ and Kai Hockerts^{2*}

¹ University of St. Gallen, Switzerland

² INSEAD, Fontainebleau, France

The article is intended as a contribution to the ongoing conceptual development of corporate sustainability. At the business level sustainability is often equated with eco-efficiency. However, such a reduction misses several important criteria that firms have to satisfy if they want to become truly sustainable.

This article discusses how the concept of sustainable development has evolved over the past three decades and particularly how it can be applied to the business level. It then goes on to describe the three types of capital relevant within the concept of corporate sustainability: economic, natural and social capital.

From this basis we shall then develop the six criteria managers aiming for corporate sustainability will have to satisfy: eco-efficiency, socio-efficiency, eco-effectiveness, socio-effectiveness, sufficiency and ecological equity. The article ends with a brief outlook towards

future research. Copyright © 2002 John Wiley & Sons, Ltd and ERP Environment.

Received 27 November 2001

Revised 2 December 2001

Accepted 17 December 2001

INTRODUCTION

Sustainability has become a mantra for the 21st century. It embodies the promise of societal evolution towards a more equitable and wealthy world in which the natural environment and our cultural achievements are preserved for generations to come. This promise touches upon elementary hopes and fears, which have both guided and challenged scores of scholars in the past. The quest for economic growth and social equity has been a major concern for most of the past 150 years. By adding concern for the carrying capacity of natural systems sustainability thus ties together the current main challenges facing humanity. While there has been extensive work on all three problems over the past four decades, it was only the 1992 Earth Summit in Rio that brought the widespread acceptance of politicians, NGOs and business leaders that none of the three problems can be solved without also solving the other two (Keating, 1993).

*Correspondence to: Kai Hockerts, INSEAD, Centre for the Management of Environmental Resources (CMER), Boulevard Constance, F-77 300 Fontainebleau, France.
E-mail: Kai.Hockerts@insead.edu



Since Rio success towards sustainable development has been mixed. Progress towards global sustainability is suspiciously absent. International treaties on the protection of biodiversity and climate change have stalled. Free trade on a global scale (which was seen as a major tool to advance economic sustainability) has fallen foul of anti-globalization protests. Finally, sincere attempts towards the alleviation of poverty and inequality are virtually inexistent. However, nudged along by relentless encouragements from NGOs (e.g. IUCN, 1991; FoE, 1992; Spapens, 1996), many governments have initiated programmes towards national sustainability (e.g. CEC, 1993; PCSD, 1994; DoE, 1994; Umweltbundesamt, 1997; Enquete Kommission, 1997; IDARio, 1997, 2000). In the case of Switzerland sustainable development has even been elevated to a constitutional goal (*Schweizerische Bundesverfassung* amended on 18 April 1999, Article 2.2).

Furthermore, in response to Chapter 28 of the Agenda 21 document (Keating, 1993) numerous local authorities have started so-called Local Agenda 21 action plans aiming at local sustainability. Econtour (2001) reports 344 German municipalities with their own Local Agenda process. In the UK Tony Blair required each local authority to produce its own Local Agenda 21 strategy by the year 2000 (LA21UK, 2001). Sustainable cities have also been the focus of a European Commission (1996) expert panel.

Another success story concerning the adoption of the term sustainable development has been at the firm level. Today most managers have accepted corporate sustainability as a precondition for doing business (IFOK, 1997; Hedstrom *et al.*, 1998; Holliday, 2001). In the run-up to Rio a group of concerned business leaders had formed the World Business Council for Sustainable Development (WBCSD) in order to facilitate the dialogue with politicians about the means of reaching sustainability. A decade later the WBCSD has grown to a coalition of about 150 international companies (WBCSD, 2001). Numerous firms appoint

corporate sustainability officers, publish sustainability reports (SustainAbility, 2000), and incorporate sustainability into their corporate communication strategies.

Whereas in the mid-1990s local authorities were probably the most active players trying to implement sustainable development, the focus has recently shifted strongly towards business as a major actor. Although it is to be commended that managers accept their responsibility for environmental and social issues, their interpretation of the 'business link to sustainable development' (DeSimone and Popoff, 1997) is also worrying. In their quest to find 'a single concept, perhaps a single word to sum up the business end of sustainable development' (WBCSD, 2000, p. 1) most firms have opted for eco-efficiency as their guiding principle.

Eco-efficiency is a valuable part of corporate strategies. However, as the sole concept it is insufficient (Welford, 1997). Schaltegger and Sturm (1990, 1992, 1998), who were among the first to use the term, had intended eco-efficiency as one corporate measure among several.¹ As this paper will demonstrate, eco-efficiency is only one part of the corporate sustainability criteria.

DEFINING CORPORATE SUSTAINABILITY

Sustainability grounds the development debate in a global framework, within which a continuous satisfaction of human needs constitute the ultimate goal (Brundtland, 1987). When transposing this idea to the business level, corporate sustainability can accordingly be defined as meeting the needs of a firm's direct and indirect stakeholders (such as shareholders, employees, clients, pressure groups, communities etc), without compromising its ability to meet the needs of future stakeholders as well. Towards this goal, firms have to maintain and

¹ On the shortcomings of a definition that is based exclusively on eco-efficiency, see an article by Schaltegger (1999).



grow their economic, social and environmental capital base while actively contributing to sustainability in the political domain. From this definition, three key elements of corporate sustainability can be identified:

Integrating the economic, ecological and social aspects in a 'triple-bottom line'

The most important departure of the sustainability concept from orthodox management theory lies in its realization that economic sustainability alone is no sufficient condition for the overall sustainability of a corporation (Gladwin *et al.*, 1995a). A single-minded focus on economic sustainability can succeed in the short run; however, in the long run sustainability requires all three dimensions to be satisfied simultaneously (see Figure 1). As the three dimensions of the 'triple-bottom-line' concept (Elkington, 1997) are inter-related, they may influence each other in multiple ways.

Integrating the short-term and long-term aspects

In recent years, driven by the stock market, firms have tended to overemphasize short-term gains by concentrating more on quarterly results than the foundation for long-term success. Such an obsession with short-term profits is contrary to the spirit of sustainability, which requires the firm to meet the needs of its stakeholders in the future as well as today. However, the existence of an economic discount rate tends to value short-term gains higher than distant costs caused by social or environmental degradation.

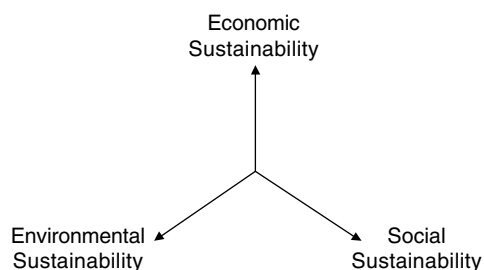


Figure 1. Three dimensions of sustainability

Consuming the income and not the capital

The requirement to maintain the capital basis is a common place in the business realm. It is broadly accepted as a precondition of successful and responsible management. However, in order to achieve long-term sustainability, businesses will have to manage not only economic capital, but also their natural capital and their social capital.

TYPES OF CAPITAL WITHIN THE TRIPLE BOTTOM LINE OF CORPORATE SUSTAINABILITY

Corporate sustainability implies a much broader interpretation of the concept of capital than is used normally by either economists or ecologists. Three different types of capital – economic, natural and social – have different properties and thus require different approaches. Furthermore, within the three main types of capital, several subtypes can be differentiated.

Economic capital

The realization that economic capital has to be managed in a sustainable way is by no means new. Hicks explained the use of income calculations as '[giving] people an indication of the amount which they can consume without impoverishing themselves. Following out this idea, it would seem that we ought to define a man's income as the maximum value which he can consume during a week, and still be expect to be as well off at the end of the week as he was at the beginning' (Hicks, 1946, p. 172).

Notwithstanding its importance, economic capital and income are far from well understood. Calculating it seems quite straightforward: add up the assets of a firm and subtract the liabilities. But what exactly are corporate assets? Traditionally one would consider fixed capital (e.g. investments in machinery) and current operating capital (e.g. bank accounts, goods on stock, receivables). Nonetheless, it is



far from easy to answer the question 'What did we earn last month?' (see e.g. Harris, 1936). Take, for example, inventory valuation. Are stocks to be considered at their raw material value? Or should the work done to make them into final goods be added? As the gap between book value and market value increases, intangible capital becomes more important and this leads to new concepts such as intellectual and organizational capital (e.g. Roos *et al.*, 1997; von Krogh *et al.*, 1998; Stewart, 1999).

What does this teach us for the concept of economic sustainability? First of all we have to acknowledge that both financial and management accounting can provide managers only with an approximation of a firm's economic capital. Furthermore, economic sustainability requires firms to manage several types of economic capital: *financial capital* (i.e. equity, debt), *tangible capital* (i.e. machinery, land, stocks) and *intangible capital* (i.e. reputation, inventions, know-how, organizational routines). A company ceases to exist once no economic capital is left, but in reality a company will become unsustainable long before. A definition for corporate economic sustainability could accordingly read as follows.

Economically sustainable companies guarantee at any time cashflow sufficient to ensure liquidity while producing a persistent above average return to their shareholders.

Natural capital

Ecological sustainability research is based on the realizations that on a finite Earth the depreciation of 'natural capital' (Lovins *et al.*, 1999, p. 146) cannot go on endlessly. There are two main types of natural capital: It can firstly take the form of natural resources. These are consumed in many economic processes, and can either be renewable (e.g. wood, fish, corn) or non-renewable (fossil fuel, biodiversity, soil quality). On the

other hand, natural capital takes the form of ecosystem services (e.g. climate stabilization, water purification, soil remediation, reproduction of plants and animals). Although the value of these services is quite considerable, they are much less understood than natural resources.

The need to understand the links between the industrial and eco-system has lead to the notion of an 'industrial metabolism' (Ayres, 1989, 1994). This idea conceives of industry as a living organism consuming energy and materials and creating desired output (in the form of products and services) as well as undesired output (in the form of waste emissions). If the industrial organism consumes more energy and materials than can be reproduced or if it emits more emissions than can be absorbed through natural sinks the industrial system becomes ecologically unsustainable (Ayres, 1995, p. 4). Lovins *et al.* (1999, p. 146) estimate the annual economic value of services provided by the global natural capital to be at least \$33 trillion, roughly equivalent to the world gross product, but this comparison can be dangerously misleading. For many services provided by the natural environment, there is no known substitute or one is available only at a prohibitive price. A definition for corporate ecological sustainability could accordingly read as follows.

Ecologically sustainable companies use only natural resources that are consumed at a rate below the natural reproduction, or at a rate below the development of substitutes. They do not cause emissions that accumulate in the environment at a rate beyond the capacity of the natural system to absorb and assimilate these emissions. Finally they do not engage in activity that degrades eco-system services.

Social capital

There are two different types of social capital: human capital and societal capital.



Human capital concerns primarily aspects such as skills, motivation and loyalty of employees and business partners. Societal capital, on the other hand, includes the quality of public services, such as a good educational system, infrastructure or a culture supportive of entrepreneurship. The notion that firms have to manage social capital is not new. The concept of 'corporate social responsibility' started to generate broader interest in the 1960s in the US (Likert, 1967) and the UK (Goyder, 1961), and then spread to continental Europe in the early 1970s. However, from the mid-1980s to the mid-1990s hardly any systematic attention was paid to the issue. Only in the very recent past has the topic once again started to attract the interest of academics, pressure groups and businesses alike.

To be a socially sustainable enterprise, Gladwin *et al.* (1995b, p. 42) require that a firm needs to internalize social costs, maintain and grow the capital stock; avoid exceeding the social carrying capacities encourage structures for self-renewal; foster democracy; enlarge the range of people's choices and distribute resources and property rights fairly. A problem with such a definition is that firms often cannot meet the expectations of all stakeholder groups simultaneously. They face trade-offs between the needs of different stakeholders. A possible solution to this dilemma could be a definition of socially sustainable corporations as those that are seen as fair and trustworthy by all stakeholder groups (Zadek *et al.*, 1997, p. 13; Kaptein and Wempe, 2001).

From this perspective, a firm can be viewed as managing social capital in a sustainable way when its stakeholders understand and can broadly agree with why a company is doing something, and not so much whether they think a particular act is a good thing. For example, imagine that a company decides to close a plant and layoff its workers. If the company can effectively communicate the reasons for closing the facility, and make clear why it had no alternatives, such a conduct could

very well be considered socially sustainable. A definition for corporate social sustainability could accordingly read as follows.

Socially sustainable companies add value to the communities within which they operate by increasing the human capital of individual partners as well as furthering the societal capital of these communities. They manage social capital in such a way that stakeholders can understand its motivations and can broadly agree with the company's value system.

The non-substitutability of capital

Traditional economic theory assumes that all input factors of production can be translated into monetary units, implying that they can also be substituted completely. Economic capital can thus very well substitute social capital and natural capital (Maler, 1990, p. 26). Daly (1991, p. 20), however, points to the fact that not all kinds of natural capital can be substituted by economic capital.² While it is possible that future generations can find ways to substitute some natural resources through technical innovations, it is much more unlikely that they will ever be able to substitute ecosystem services (e.g. the protection provided by the ozone layer, or the climate stabilizing function of the Amazonian forest). This is why Costanza *et al.* (1991, p. 8) emphasize the complementarity of natural capital and economic capital. A major obstacle to substitutability lies also in the multi-functionality of many natural resources. Forests, for example, do not only provide the raw material for paper (which can be substituted quite easily), but they also provide shelter for plants and animals, regulate the flow of rain water, absorb CO₂ and may contain plants with valuable pharmaceutical properties.

² A more detailed summary of the debate for and against the assumption of non-substitutability can be found in a paper by Minsch (1993).



Similar considerations are also true in the case of social capital. Although it is possible to substitute the effect of motivation and loyalty of stakeholders through economic incentives, there are certain limits to such an approach. When stakeholder disaffection reaches a certain point, firms cannot undo this by simply offering higher wages or other financial benefits. The resource-based view of the firm (Barney, 1991) – which states that certain capabilities of firms cannot be imitated or substituted by others – implicitly recognizes that certain kinds of social capital cannot be easily substituted. This becomes even more evident at the level of societal capital, which is a major precondition for economic activity. No firm can thrive in a society that is not well educated or healthy or lacks adequate infrastructure.

Finally, we have to consider the normative limits of substitutability (Daly, 1991, p. 41). Even if certain species were of no direct or indirect value to mankind, would we not be morally and ethically required to protect them beyond the mere consideration for an anthropocentric optimum? Attempts to protect cultural heritage, as well as linguistic and cultural diversity (Harmon, 1996; Wurm, 1996), are also indicators that do not support economic substitutability of social capital.

Irreversibility and non-linearity of capital depletion

Another problem of natural and social capital deterioration lies in their irreversibility. The loss in biodiversity, for example, is definite. Up to a certain point, reduced soil productivity can be substituted through increased use of fertilizer. However, in many parts of the world, soil erosion has reached the level of deterioration at which the damage cannot longer be reversed. The same is true for cultural diversity. For example, since the arrival of the Portuguese in Brazil 500 years ago the number of indigenous languages has dropped by more than 75% (British Telecom, 2000, p. 13).

A further problem lies in the non-linearity of natural and social processes. A lake can, for example, absorb nutrients for a long time while actually increasing its productivity. However, once a certain level of algae is reached, the lack of oxygen causes the lake's ecosystem to break down all of a sudden. Similarly, the consumption of natural and social capital often has no impact until a certain threshold is reached. Ehrlich and Ehrlich (1981, p. xi) make the useful comparison between marginal analysis – the major tool of neoclassical economic analysis – and an aeroplane mechanic who removes a single rivet before each flight. He can argue that the plane is able to fly with fewer rivets until the point at which the plane breaks up and crashes.

BEYOND THE BUSINESS CASE: AN EXTENDED FRAMEWORK FOR CORPORATE SUSTAINABILITY

In trying to bring sustainability 'down to earth' (Reinhardt, 1999; Dyllick, 1999; Dyllick *et al.*, 1999; Fussler and James, 1996) many businesses and academic scholars have tended to focus on the 'business case' for sustainable development. In this perspective, they ask how firms can further their economic sustainability by paying attention to social and environmental issues, i.e. increase their ecological and social efficiency. Although such an approach is an important step towards corporate sustainability, it is unfortunately not enough.

For a corporation to become truly sustainable, it has to address two more cases of sustainable development. First, managers have to consider the 'natural case' for corporate sustainability: as long as a firm is operating close to (or even beyond) the environment's carrying capacity, it can never become truly sustainable. Second, firms also need to make the 'societal case' for sustainability. In a world where the three capital types are completely substitutable, a distinction between the business, natural and societal case for corporate



sustainability would be unnecessary. However, non-substitutability, non-linearity and irreversibility all prevail in the real world.

The business case for corporate sustainability

The most broadly accepted criterion for corporate sustainability constitutes a firm's efficient use of natural capital. This eco-efficiency is usually calculated as the economic value added by a firm in relation to its aggregated ecological impact (Schaltegger and Sturm, 1990, 1992, 1998). This idea has been popularized by the WBCSD as the 'business link to sustainable development' (Schmidheiny, 1992; Ayres *et al.*, 1995; DeSimone and Popoff, 1997):

Eco-efficiency is achieved by the delivery of competitively-priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life-cycle to a level at least in line with the earth's carrying capacity (DeSimone and Popoff, 1997, p. 47).

In their quest to find a single concept to sum up the business end of sustainable development (WBCSD, 2000, p. 1), most firms have opted for eco-efficiency as their guiding principle. Current indicators used include energy, water and resource efficiency, as well as waste or pollution intensity (e.g. von Weizsaecker *et al.*, 1997; Verfaillie and Bidwell, 2000).

Similar to the eco-efficiency concept (but has been so far less explored) is the second criterion for corporate sustainability: socio-efficiency.

Socio-efficiency (Hockerts, 1996, 1999; Figge and Hahn, 2001) describes the relation between a firm's value added and its social impact. While it can be assumed that most business impacts on the environment are negative, this is not true for social impacts. They can be both positive (e.g. corporate giving, creation of employment) and negative (e.g. work accidents, mobbing of employees, human rights abuses). Depending on the type of impact, socio-efficiency thus implies minimizing negative social impacts (i.e. accidents per value added) or maximizing positive social impacts (i.e. donations) in relation to the value added. Both eco-efficiency and socio-efficiency are concerned primarily with increasing economic sustainability (see Figure 2).

The natural case for corporate sustainability

Although eco- and socio-efficiency are valuable tools, they only lead to relative improvements. Typical results would be increased energy or resource efficiency per value added. However, ecological sustainability is not only concerned with relative improvements. Due to the problem of non-substitutability, non-linearity and irreversibility it has also to consider absolute thresholds. For example, it is important whether an emission is released into a system that is still largely unpolluted or whether the receiving system is already so close to its carrying capacity that the extra emission will cause the whole system to break down.

From an environmental point of view, the main issue is therefore not eco-efficiency but eco-effectiveness.³ The importance difference

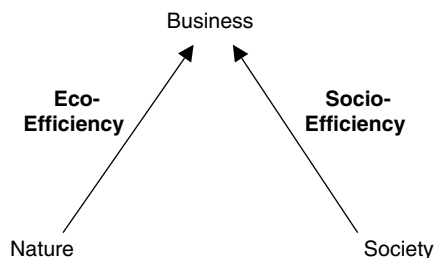


Figure 2. The 'business case' of corporate sustainability

³ The term eco-effectiveness is used in different ways. It was used by Schaltegger and Sturm (1990, 1992, 1998) in the sense of technical effectiveness, which complements the economic value orientation of eco-efficiency. Braungart and McDonough (Braungart, 1994; Braungart and McDonough, 1998; MBCD, 2001) on the other hand use the term in clear opposition to eco-efficiency: 'Long-term prosperity depends not on the efficiency of a fundamentally destructive system, but on the effectiveness of processes designed to be healthy and renewable in the first place. Eco-effectiveness celebrates the abundance and fecundity of natural systems, and structures itself around goals that target 100 percent sustaining solutions' (MBCD, 2001). An extensive discussion of the two concepts can be found in a



between these two criteria can be easily demonstrated by the following example: making the distribution system of a firm more efficient (i.e. increasing the number of products a sales agent can sell within a given period of time) will in most cases make more economic sense. However, if the firm has a negative contribution margin (i.e. the production cost per product is higher than the market price), such a strategy would only lead to bankruptcy. The more products the firm sells, the higher its losses will be. Many firms with an insufficient accounting system have fallen victim to this type of efficiency trap. When subscribing to eco-efficiency, firms run a similar risk of fuelling rather than reducing ecological degradation, which is an argument that is made by Senge (1999, p. 178):

It is possible for resource productivity to improve and for natural systems to decline. Indeed, some industry studies have indicated that just this is happening. ...Rapid growth at less resource intensity is not even necessarily a step forward: if the growth rate swamps the productivity improvement rate (especially on a global scale), total resource extraction may actually increase.

More efficient cars, for example, reduce the cost of driving a car. However, today roughly 70–80% of the world population cannot afford to use cars to meet their needs for individual mobility. Thus more efficient (and thus less costly) cars might very well backfire from an ecological point of view by increasing the number of cars and of kilometres driven per year. In order to avoid this type of rebound effect, companies will have to focus on the absolute amount of mobility-induced CO₂ emissions worldwide. The focus then might shift from fossil fuel efficiency to the effectiveness of solar powered fuel cells.

book by Stahlmann and Clausen (2000), which analyses systems and rebound effects (see also Stahlmann, 1996; Stahlmann and Clausen, 1999).

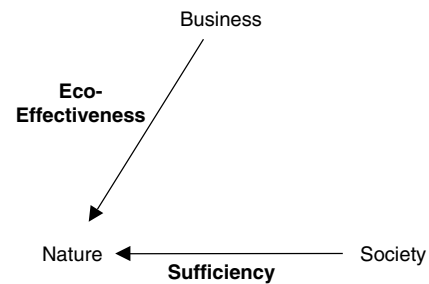


Figure 3. The 'natural case' of corporate sustainability

Producing eco-effective products and services is not the only criterion in the natural case for corporate sustainability. Efficiency gains are frequently undone by simple consumer choice. For example, fuel efficiency gains in automobiles have declined substantially in recent years due to the growing demand for fuel-guzzling sport utility vehicles (SUV). Realizing that consumption is an important lever towards sustainability, some authors suggest yet another criterion – sufficiency (Schumacher, 1974; Sachs, 1993; Gladwin *et al.*, 1995a; Umweltbundesamt, 1997; Kreibich, 1997; Diekmann, 1999; Zavestovski, 2001). Most advocates see sufficiency as an issue of individual choice rather than a single firm's responsibility. Radical advocates accordingly ask for 'brand jamming' and customers' out-right refusal to follow what they see as marketing terror (e.g. Klein, 2000). Both eco-effectiveness and sufficiency are criteria looking at ecological sustainability as their main goal with business and society as the main drivers for producing greater environmental good (see Figure 3).

The societal case for corporate sustainability

The final two criteria of corporate sustainability concern social sustainability. While socio-efficiency can be a helpful instrument for a relative increase in social sustainability, such a strategy might lead to islands of social excellence within a sea of social discontent. Many firms, for example, work hard to serve their clients even better and at lower costs. However,



the consumers to whom these products and services are available only make up a small part of the world population. A large part of what Hart and Prahalad (1999) call the 'bottom of the pyramid' is excluded from even the most basic services and products such as food, health and financial services or communication. An example of a sector that has come under attack in recent years for failing to provide its products to poor countries is the pharmaceutical industry (Oxfam, 2001). From a socio-effectiveness perspective, business conduct should be judged not on a relative scale but rather in relation to the absolute positive social impact a firm could reasonably have achieved.

Ecological equity stands at the nexus of the relationship between the management of natural capital and social sustainability. While current generations consume large parts of the earth's natural capital, the bulk of the damage is likely to be borne by future generations. If social sustainability is to be achieved, an equitable solution will have to be found for the distribution of natural capital. Unfortunately, indicators to guide firms on this sustainability criterion do not yet exist. Future research will have to assess how firms can practically further social sustainability by employing economic and natural capital for the greater societal good (see Figure 4).

Overview of the three cases for corporate sustainability

Firms aiming for corporate sustainability have to satisfy the criteria outlined above. However,

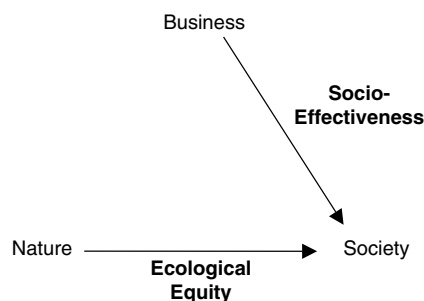


Figure 4. The 'societal case' of corporate sustainability

the extent to which a specific case is regarded as most important will vary according to time and context. It can also be assumed that corporate managers will place greater emphasis on the business case while the natural or societal case will only become relevant if external systems (politics, consumers) force firms to take notice (Dyllick, 1989). However, as all companies are guided to some extent by a set of political-ethical values that are entrenched in the firm's culture, business managers may promote corporate sustainability without making an explicit calculation of the economic costs and benefits. Figure 5 gives a summary overview of the three cases and the six criteria for corporate sustainability⁴.

CONCLUSION AND SUGGESTIONS FOR FUTURE RESEARCH

The goal of this paper is to contribute to the ongoing effort of understanding corporate sustainability and developing clear indicators for firms to use in their strategy development. Some of the key points emphasized in this paper include the following.

- First, although the debate about eco-efficiency is by far from over, we argue in this paper that issue of eco-effectiveness deserves equal scholarly attention.

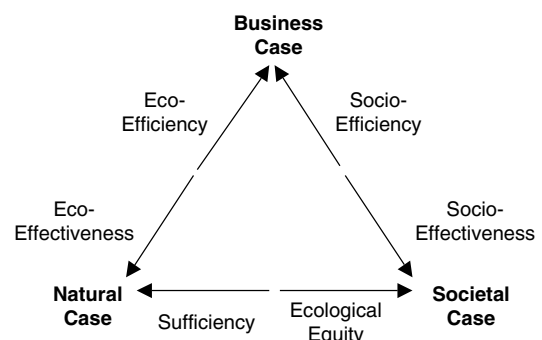


Figure 5. Overview of the six criteria of corporate sustainability

⁴ This triangle adapts and extends earlier work by Hockerts (1996, 1999).



- Second, the relationship between business and social sustainability is receiving more attention as a research issue. However, the research to date has failed to provide a systematic framework for both socio-efficiency and socio-effectiveness.
- Third, there is a critical need to develop business relevant criteria for such issues as ecological equity. Current research is largely focused on the role politics and individual consumers can play in the development of these criteria. We need to bring in the private sector as a stakeholder into this process.

The most relevant contributions to this nascent field may come from theory building. With the concept of sustainability so unclear, considerable more attention needs to be given to building a systematic theory of corporate sustainability. In this context, the growing number of publications analysing the link between (both ecological and social) sustainability and firm profitability should prove to be useful in theory building⁵. More quantitative hypothesis testing would also be helpful for areas such as the actual magnitude of the rebound effect and its impact on eco-effectiveness.

Finally, future research will have to address the fact that triple-bottom-line integration has many doubters. In a recent essay, criticizing sustainability as a buzzword devoid of content, Esty, for example, is concerned that '[p]aired with the social agenda, the environment tends to get short shrift' (Esty, 2001, p. 75). Future research on integrated corporate sustainability needs to ponder whether it is possibly increasing confusion and risks political compromises rather than leading to overall improvements. One hypothesis could be that a separation of the three areas makes sense at the operational level (i.e. keeping operative economic, environmental and social responsibilities distinct), while a strategic decision would only be possible when considering the three dimensions simultaneously.

⁵ For recent publications see a review by Berchicci *et al.* (2001).

ACKNOWLEDGEMENTS

We acknowledge helpful comments from Thomas Bieker and Carl-Ulrich Gminder (Universität St. Gallen), as well as from the editors of this special issue.

REFERENCES

- Ayres R. 1989. Industrial metabolism and global change. *International Social Sciences Journal* **121**: 23–42.
- Ayres R. 1994. Industrial metabolism: theory and policy. In *Industrial Metabolism: Restructuring for Sustainable Development*, Ayres R, Simonis UE (eds). United Nations University Press: Tokyo; 3–20.
- Ayres R. 1995. *Statistical Measures of Unsustainability*, R&D Working Paper No. 95/84/EPS. INSEAD: Fontainebleau.
- Ayres R, Flückiger P, Hockerts K (eds). 1995. *Report of the Second Antwerp Eco-Efficiency Workshop, March 1995*. WBCSD: Geneva.
- Barney JB. 1991. Firm resources and sustained competitive advantage. *Journal of Management* **17**(1): 99–121.
- Berchicci V, Hockerts K, Wagner M. 2001. Towards a better understanding of the correlation between corporate environmental sustainability and financial performance. *Proceedings of the 10th Business Strategy and the Environment Conference*. ERP Environment: Leeds.
- Braungart M. 1994. Ein Wirtschaftssystem für 'intelligente Produkte' anstatt einer High-Tech Abfallwirtschaft. In *Kreislaufwirtschaft statt Abfallwirtschaft*, Hockerts K *et al.* (eds). Universitätsverlag: Ulm; 45–55.
- Braungart M, McDonough W. 1998. The next industrial revolution. *The Atlantic Monthly* October, **282**(4): 82–92.
- British Telecom. 2000. *Variety and Values: a Sustainable Response to Globalisation?* British Telecom: London.
- Brundtland GH. 1987. *Our Common Future*. World Commission on Environment and Development: Brussels.
- Commission for the European Communities (CEC). 1993. *Towards Sustainability*. Brussels: CEC.
- Costanza R, Daly HE, Bartholomew J. 1991. Goals, agenda and policy recommendations for ecological economics. In *Ecological Economics*, Costanza R (ed.). Columbia University Press: New York; 1–20.
- Daly HE. 1991. *Steady-State Economics*, 2nd edn with new essays. Island: Washington, DC.
- Department of the Environment (DoE). 1994. *Sustainable Development: the UK Strategy*. DoE: London.
- DeSimone L, Popoff F. 1997. *Eco-Efficiency: the Business Link to Sustainable Development*. MIT Press: Cambridge.
- Diekmann J. 1999. Ökologischer Strukturwandel als vergessene Komponente des Ressourcenverbrauchs, Zwischen Effizienz und Suffizienz. *Ökologisches Wirtschaften* **3**: 25–26.



- Dyllick T. 1989. *Management der Umweltbeziehungen*, Gabler: Wiesbaden.
- Dyllick T. 1999. Environment and competitiveness of companies. In *International Environmental Management Benchmarks*, Hitchens DMWN, Clausen J, Fichter K (eds). Springer: Berlin.
- Dyllick T, Belz FM, Schneidewind U. 1999. *Ökologie und Wettbewerbsfähigkeit*. Hanser: Munich.
- Econtour. 2001. German LA21 Portal www.econtour.de/la21/la21_deutschland.htm [19 November 2001].
- Ehrlich PR, Ehrlich A. 1981. *Extinction: the Causes and Consequences of the Disappearance of Species*. Random: New York.
- Elkington J. 1997. *Cannibals With Forks: the Triple Bottom Line of 21st Century Business*. Capstone: Oxford.
- Enquete Kommission. 1997. *Konzept Nachhaltigkeit, Zwischenbericht der Enquete-Kommission 'Schutz des Menschen und der Umwelt'*. Dt. Bundestag: Bonn.
- Esty D. 2001. A term's limits. *Foreign Affairs* 5: 74–75.
- European Commission. 1996. *European Sustainable Cities*. European Commission DG XI Expert Group on the Urban Environment: Brussels.
- Figge F, Hahn T. 2001. Sustainable value added – measuring corporate contributions to sustainability. *Conference Proceedings on the 2001 Business Strategy and the Environment Conference in Leeds*. ERP Environment: Shipley; 83–92.
- Friends of the Earth (FoE). 1992. *Sustainable Netherlands*. FoE Netherlands: Amsterdam.
- Fussler C, James P. 1996. *Eco-Innovation: a Break through Discipline for Innovation and Sustainability*. Pitman: London.
- Gladwin T, Kennelly J, Krause TS. 1995a. Shifting paradigms for sustainable development: implications for management theory and research. *Academy of Management Review* 20(4): 874–907.
- Gladwin T, Kennelly J, Krause TS. 1995b. Beyond eco-efficiency: towards socially sustainable business. *Sustainable Development* 3: 35–43.
- Goyder G. 1961. *The Responsible Company*. Blackwell: Oxford.
- Harris JN. 1936. What did we earn last month? *N.A.C.A. Bulletin* 17(Sect. 1): 501–527.
- Harmon D. 1996. Losing species, losing languages: connections between biological and linguistic diversity. *Southwest Journal of Linguistics* 15.
- Hart SL. 1997. Beyond greening: strategies for a sustainable world. *Harvard Business Review* 75: 66–76.
- Hart SL, Prahalad CK. 1999. Strategies for the bottom of the pyramid: creating sustainable development, Unpublished draft paper.
- Hedstrom G, Poltorzycki S, Stroh P. 1998. Sustainable development: the next generation. *Prism – Sustainable Development: How Real, How Soon, and Who's Doing What?* 4: 5–19.
- Hicks JR. 1946. *Value and Capital*. Clarendon: Oxford.
- Hockerts K. 1996. *The SusTainAbility Radar (STAR*)*, a Step towards Corporate Sustainability Accounting, discussion paper. New Economics Foundation: London.
- Hockerts K. 1999. The sustainability radar – a tool for the innovation of sustainable products and services. *Greener Management International* 25: 29–49.
- Holliday C. 2001. Sustainable growth, the DuPont way. *Harvard Business Review* September: 129–134.
- Interdepartementaler Ausschuss Rio (IDARio). 1997. *Nachhaltige Entwicklung in der Schweiz – Stand der Realisierung*. IDARio: Bern.
- Interdepartementaler Ausschuss Rio (IDARio). 2000. *Stand der Umsetzung der Strategie 'Nachhaltige Entwicklung in der Schweiz'*. IDARio: Bern.
- IFOK. 1997. *Bausteine für ein zukunftsfähiges Deutschland, Diskursprojekt im Auftrag von VCI und IG Chemie-Papier-Keramik*. Gabler: Wiesbaden.
- International Union for Conservation of Nature and Natural Resources (IUCN). 1980. *World Conservation Strategy, Living Resource Conservation for Sustainable Development*. IUCN, United Nations Environment Programme (UNEP) and World Wildlife Fund (WWF): Gland.
- International Union for Conservation of Nature and Natural Resources (IUCN). 1991. *Caring for the Earth: a Strategy for Sustainable Living*. IUCN, United Nations Environment Programme (UNEP) and World Wildlife Fund (WWF): Gland.
- Kaptein M, Wempe J. 2001. Sustainability management, balancing conflicting economic, environmental, and social corporate responsibilities. *Journal of Corporate Citizenship* 1(2): 91–106.
- Keating M. 1993. *The Earth Summit's Agenda for Change*. Centre for Our Common Future: Geneva.
- Klein N. 2000. *No Logo: Taking Aim at Brand Bullies*. Picador: London.
- LA21UK. 2001. UK LA21 Portal. www.la21-uk.org.uk [19 November 2001].
- Likert R. 1967. *The Human Organization: its Management and Value*. McGraw-Hill: Tokyo.
- Lovins AB, Lovins LH, Hawken P. 1999. A road map for natural capitalism. *Harvard Business Review* 77(3): 145–158.
- Maler KG. 1990. Sustainable development. *Sustainable Development: Science and Policy. Conference Report*, 8–12 May 1990. NAVF: Bergen.
- MBCD. 2001. *Eco-Effectiveness – Nature's Design Patterns*. www.mbcd.com/c2c_ee.htm [19 November 2001].
- Minsch J. 1993. *Nachhaltige Entwicklung: Idee – Kernpostulate*, Discussion Paper No. 14. Institut für Wirtschaft und Ökologie: St. Gallen.
- Oxfam. 2001. *Pfizer – the Industry Leader in Pricing Drugs Beyond the Reach of the Poor in Developing Countries*, Oxfam GB News Release. 19 July.
- US President's Council on Sustainable Development (PCSD). 1994. *A Vision for a Sustainable US*



- and *Principles of Sustainable Development*. PCSD: Washington, DC.
- Reinhardt FL. 1999. *Bringing the Environment Down to Earth: Applying Business Principles to Environmental Management*. Harvard Business School Press: Boston, MA.
- Roos J, Roos G, Dragonetti NC, Edvinsson L. 1997. *Intellectual Capital: Navigating in the New Business Landscape*. New York University Press: New York.
- Sachs W. 1993. Die vier E's. Merkposten für einen maßvollen Wirtschaftstil. *Politische Ökologie Special Issue 'Lebensstil oder Stilleben'* Sept/Oct: 69–72.
- Schaltegger S. 1999. Öko-Effizienz als Element des sozio-ökonomisch vernünftigen Umweltmanagements, Ein Kriterium unter vielen. *Ökologisches Wirtschaften* 3: 12–14.
- Schaltegger S, Sturm A. 1990. Ökologische Rationalität. *Die Unternehmung* 4: 273–290.
- Schaltegger S, Sturm A. 1992. *Ökologieorientierte Entscheidungen in Unternehmen*. Haupt: Bern.
- Schaltegger S, Sturm A. 1998. *Eco-Efficiency by Eco-Controlling*. VDF: Zürich.
- Schmidheiny S. 1992. *Changing Course*. MIT Press: Cambridge.
- Schumacher EF. 1974. *Small is Beautiful*. Abacus: London.
- Schweizerische Bundesverfassung vom 18.4.1999. Bundesrat: Bern.
- Senge P. 1999. Letter to the Editor. *Harvard Business Review* 77(4): 178–179.
- Spapens P (ed.). 1996. *Sustainable Netherlands Revised*. Friends of the Earth Netherlands: Amsterdam.
- Stahlmann V. 1996. Öko-Effizienz und Öko-Effektivität. *UmweltWirtschaftsForum* 4: 12–14.
- Stahlmann V, Clausen J. 1999. Was ist der geeignete Maßstab für die Umweltleistungsmessung? Öko-Effizienz und Öko-Effektivität. *Ökologisches Wirtschaften* 3: 17–18.
- Stahlmann V, Clausen J. 2000. *Umweltleistung von Unternehmen. Von der Öko-Effizienz zur Öko-Effektivität*. Gabler: Wiesbaden.
- Stewart TA. 1999. *Intellectual Capital: the New Wealth of Organizations*. Doubleday.
- Stivers R. 1976. *The Sustainable Society: Ethics and Economic Growth*. Westminster: Philadelphia, PA.
- Sustain Ability. 2000. *The Global Reporters*. SustainAbility: London.
- Umweltbundesamt. 1997. *Nachhaltiges Deutschland, Wege zu einer dauerhaft-umweltgerechten Entwicklung*. Schmidt: Berlin.
- Verfaillie HA, Bidwell R. 2000. *Measuring Eco-Efficiency, a Guide to Reporting Company Performance*. World Business Council for Sustainable Development: Geneva.
- von Krogh G, Roos J, Kleine D. 1998. *Knowing in Firms: Understanding, Managing and Measuring Knowledge*, 2nd edn. Sage: London.
- von Weizsäcker EU, Lovins A, Lovins H. 1997. *Factor Four – Doubling Wealth, Halving Resource Use*. Earthscan: London.
- Welford R. 1997. *Hijacking Environmentalism, Corporate Responses to Sustainable Development*. Earthscan: London.
- WBCSD. 2000. *Eco-Efficiency: Creating more value with less impact*, Geneva: World Business Council for Sustainable Development.
- World Business Council for Sustainable Development (WBCSD). 2001. *WBCSD Website*. www.wbcsd.org [19 November 2001].
- Wurm S. 1996. *The Atlas of World Languages in Danger of Disappearing*. UNESCO: Paris.
- Zadek S, Pruzan P, Evans R. 1997. *Building Corporate Accountability – Emerging Practices in Social and Ethical Accounting, Auditing and Reporting*. Earthscan: London.
- Zavestovski S. 2001. Environmental concern and anti-consumerism in the self-concept: do they share the same basis? In *Exploring Sustainable Consumption*, Cohen MJ, Murphy J (eds). Pergamon: Amsterdam; 173–190.

BIOGRAPHY

Dr. Thomas Dyllick is Professor of Environmental Management at the University of St. Gallen (Switzerland), and Director of the Institute for Economy and the Environment (IWÖ-HSG). He can be contacted at University St. Gallen, IWÖ-HSG, Tigerbergstrasse 2; CH-9008 St. Gallen, Switzerland.

Tel.: +41 (71) 2242 595.

Fax: +41 (71) 2242 722.

E-mail address: www.iwoe.unisg.ch;

Thomas.Dyllick@unisg.ch

Kai Hockerts is Research Programme Manager at INSEAD heading the Centre for the Management of Environmental Resources (CMER). He can be contacted at INSEAD, Centre for the Management of Environmental Resources (CMER), Boulevard Constance; F-77300 Fontainebleau (France);

Tel: +33 (1) 60 72 43 86.

Fax: +33 (1) 60 74 55 64.

Email address: Kai.Hockerts@insead.edu;
www.insead.edu/CMER.