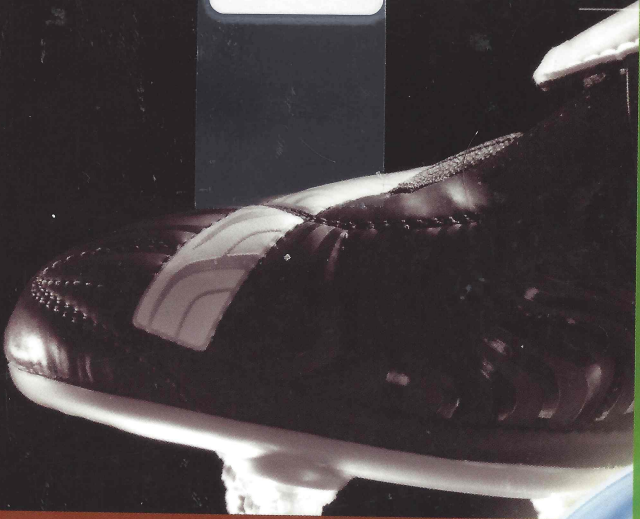
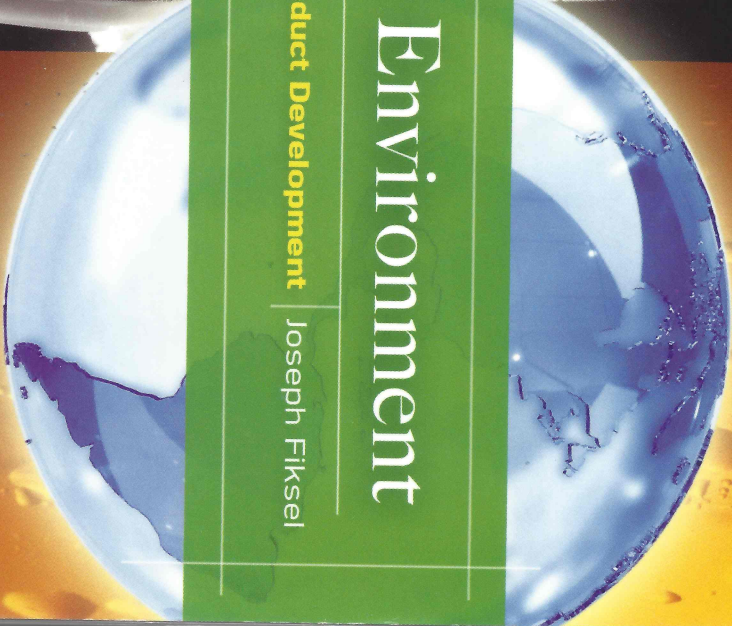


Second Edition

Design for Environment

A Guide to Sustainable Product Development

Joseph Fiksel



back

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"To the people of poor nations, we pledge to work alongside you to make your farms flourish and let clean waters flow; to nourish starved bodies and feed hungry minds. And to those nations like ours that enjoy relative plenty, we say we can no longer afford indifference to suffering outside our borders; nor can we consume the world's resources without regard to effect. For the world has changed, and we must change with it."

President Barack H. Obama
Inaugural Address
January 20, 2009

CHAPTER 4

Business Value Drivers

The multinational corporation, with its efficiency, assets and capacity for innovation, is the only institution with the resources necessary to produce a sustainable global economy.

STUART HART [1]

Sustainability Goes Mainstream

In the early days of the environmental movement, capitalism was perceived to be in opposition to environmental protection. The caricature of “big business” was a smokestack belching out pollution, and those involved in manufacturing industries jokingly referred to chemical odors as “the smell of money.” Thanks to environmental legislation and pollution control technologies, most of the odors are long gone, but the image persists. Every so often, an unfortunate industrial accident has occurred to reinforce that image—notably, the Union Carbide isocyanate release in Bhopal, India and the Exxon-Valdez oil spill in Alaska. The Enron scandal of 2001, as well as WorldCom and other cases of corporate fraud, further contributed to the notion that businesses are avaricious and amoral. In response, the Sarbanes-Oxley Act of 2002 imposed new requirements for corporate governance, accounting, and financial reporting [2].

Although crises and scandals attract media attention, the vast majority of business managers are scrupulous and civic-minded citizens who are genuinely concerned about environmental and social well being. Virtually all major companies have adopted the concept of *corporate citizenship*, which suggests that businesses have an ethical responsibility to society in addition to their statutory obligations. The notion of citizenship is entirely consistent with the creeds and value systems that are central to the corporate culture of most multinational corporations. These creeds often hark back to the founding

of the company and express the fundamental principles and values by which employees are expected to conduct themselves, such as integrity, respect, and teamwork, which become part of the corporate identity [3]. Examples include the HP Way and the Johnson & Johnson Credo (see Chapter 14).

While values are important, the oft-repeated phrase "doing the right thing" is merely a platitude, not a business strategy. The motivation for adopting practices such as DFE goes beyond ethics and good citizenship—it is ultimately a strategic business decision. In simple terms, *business value is the most important driver of DFE*. In fact, corporations all over the world have recognized that sustainability makes good business sense and is essential for their survival and growth [4]. Many CEOs have asserted a belief that sustainable business practices will improve both enterprise resource productivity and stakeholder confidence. At the same time, corporations are beginning to consider the interests of a broader range of stakeholders, including not only customers and shareholders, but also employees, local communities, regulators, lenders, suppliers, business partners, and advocacy groups (see Table 3.1). All of these stakeholders have the power to help or hinder the success of the business.

It is clear that U.S. corporations are eager to communicate their sustainability commitments to their stakeholders. According to a report by the Sustainable Investment Research Analysts Network covering the period from mid-2005 through the end of 2007, over 50% of America's 100 largest publicly traded companies (the S&P 100) report on their sustainability efforts. Over a third of those reports integrate elements of the GRI sustainability reporting guidelines mentioned in Chapter 3. Moreover, 86 of the S&P companies have corporate sustainability websites, a 48% increase since 2005. In recent years, the wave of sustainability adoption has accelerated, as some of America's most influential companies have joined the parade, including Procter & Gamble, General Electric, and even Wal-Mart (see Chapter 19). Some of the factors that explain this phenomenal growth are described below.

Evolution of Environmental Strategy

In the course of about fifty years, environmental sustainability has migrated from an obscure fringe concept to a mainstream concern at the highest levels of corporate governance. The emerging public awareness of environmental sustainability challenges, beginning in the 1960s, was the first wave that heralded a transformation of industry attitudes toward environmental and social responsibility. The second wave, beginning in the late 1980s, was the codification of principles of conduct and best practices—a vital prerequisite to broad adoption of corporate sustainability goals. The third wave, which boosted both environmental awareness and codification of practices, was the sud-

den growth in public concern over climate change, which began in the early 2000s.

Figure 4.1 traces the evolution of thinking in the business community through the decades, beginning in the 1960s when the predominant mindset was compliance with the law. Despite the emergence of environmental advocacy groups, environmental issues were addressed in a reactive fashion and only caught the public's attention when crises occurred, such as the Cuyahoga River in Cleveland catching fire in 1969. The 1970s marked an era of change, with the formation of the U.S. Environmental Protection Agency and the enactment of a series of laws aimed at cleaning up the environment. Companies began to think systematically about environmental risk management to prevent unplanned incidents, such as the loss of radioactive coolant at Three Mile Island in 1979.

In the 1980s, many businesses began to see a connection between cleaner production and operational efficiency. This gave rise to the voluntary practice of *pollution prevention* (Known as P2), i.e., modifying production processes and technologies so that they generate less pollution and waste. Proactive P2 practices included better house-keeping to assure efficient use of resources, elimination of toxic or hazardous substances, process simplification, source reduction, and recycling of process wastes. These techniques formed the basis for many of the DFE guidelines described in Chapter 8.

As the total quality movement took hold during the 1990s, the next logical step was extension of P2 and DFE concepts to the full product life cycle. Companies in the chemical and other industries began to recognize that a defensive posture toward environmental, health, and safety issues no longer made sense. Rather, they decided that it was important to affirm their values and articulate a constructive approach

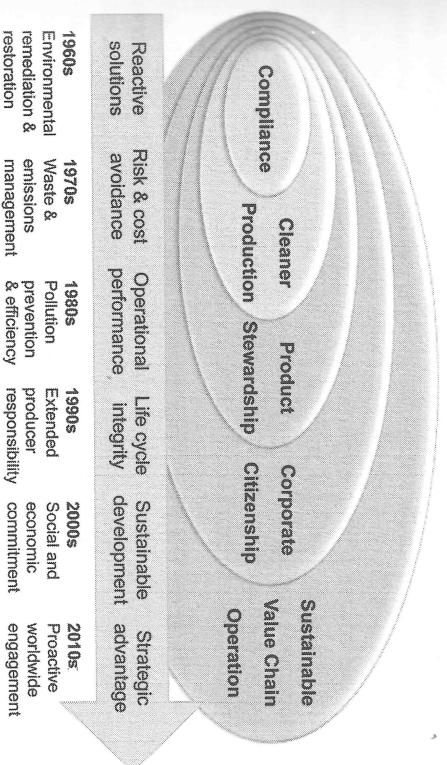


Figure 4.1 The scope of environmental responsibility has extended beyond compliance and beyond the enterprise boundaries.

toward stakeholder concerns. Environmental management system standards and codes of conduct were developed to promote best practices. The concept of *product stewardship* emerged as an ethical commitment by companies to integrity and care in the management of their assets and products, extending to all phases of manufacturing and distribution. Table 4.1 is an example of a product stewardship checklist from this era, which DuPont distributed freely.

Around the turn of the twenty-first century, the progressively expanding scope of producer responsibility led to broad adoption of corporate citizenship and sustainable development principles, including stewardship of the “commons”—protection of natural resources and ecosystem services. By this time, most corporations had embraced a broader commitment to social and economic well-being and had initiated stakeholder outreach and dialogue. During this period, the financial community began to recognize the important linkages between sustainability and shareholder value, discussed later in this chapter, and socially responsible investing began to accelerate.

Today, in search of strategic advantage, companies are expanding the scope of their sustainability initiatives to their full value chains. As discussed in Chapter 10, proactive management of the full product life cycle implies that companies not only need to implement green purchasing and operations policies but also must ensure that their suppliers adopt sustainable business practices. These efforts have already begun, as illustrated by the Electronic Industry Code of Conduct described in Chapter 11. One of the key factors reinforcing this trend is the expansion of multinational companies into developing nations, where they must confront poverty reduction and quality of life issues. At this point, environmental responsibility becomes inseparable from social responsibility. At the leading edge of corporate sustainability, companies are exploring how they can assure safe and ethical labor practices in developing nations and how they can partner with communities at the “base of the pyramid” to create viable new businesses [5].

In the course of this evolutionary journey, the role of environmental issues in decision making has shifted from a tactical risk-management approach that emphasizes cost avoidance to a strategic life-cycle management approach that emphasizes value creation. Figure 4.2 uses marginal economic analysis to illustrate this shift:

- Under the traditional risk management paradigm, companies are largely concerned with identifying and mitigating sources of risk that may result in financial liability. They will invest in risk-control expenditures to the extent that the next marginal dollar of expenditure does not exceed the corresponding reduction in potential liability, although the latter is difficult to assess due to the presence of large uncertainties.

<ul style="list-style-type: none"> • What are the principal safety, health, and environmental (SHE) hazards? • What competitive products may be substituted for ours? What are their SHE hazards? What advantages do we have? • Does the customer have our MSDS and product information?
<p>Product and packaging use</p> <ul style="list-style-type: none"> • How does the customer use the product? For what purpose? Are there unique or new users? • Do any uses or handling raise potential SHE concerns? • Do the customer's employees have access to product information? • Are the customer's employees using recommended personal protective equipment? • Are recommended protective systems, including local ventilation, in place? • Has the customer done workplace monitoring? Should this be done? • Is the product stored properly? Storage tanks labeled? Spill containment facilities, e.g., dikes? • Does the customer have emergency response procedures in place? • What happens to product packaging? Is it reduced, reused, recycled?
<p>Product issues</p> <ul style="list-style-type: none"> • Have there been any incidents involving our product? What was learned? • Have allegations been made regarding health effects of the product? Environmental effects? • Any other issues associated with the product?
<p>Product emissions and disposal</p> <ul style="list-style-type: none"> • Does any part of the product become waste? Regulated hazardous waste? How is it disposed of? • Is any part of the product discharged to a wastewater treatment system? What is its fate? • Are there any air emissions from the product's use or disposal? What is their fate? • How do the discharges/emissions affect customer permits, compliance? • How can we continuously reduce all emissions and waste?
<p>Distributor questions</p> <ul style="list-style-type: none"> • Does the distributor open and repackage or blend our product? • If so, answer relevant questions above for the distributor. • Does the distributor provide product information to all customers? How do we know this? • Does the distributor visit customers to confirm proper use and disposal?
<p>Other</p> <ul style="list-style-type: none"> • Can we help in SHE? (Waste management and minimization; SHE training). • Does the potential exist for exposure to downstream users of our product? If so, answer relevant questions above for downstream users.

Table 4.1 Product Stewardship Checklist Developed by DuPont

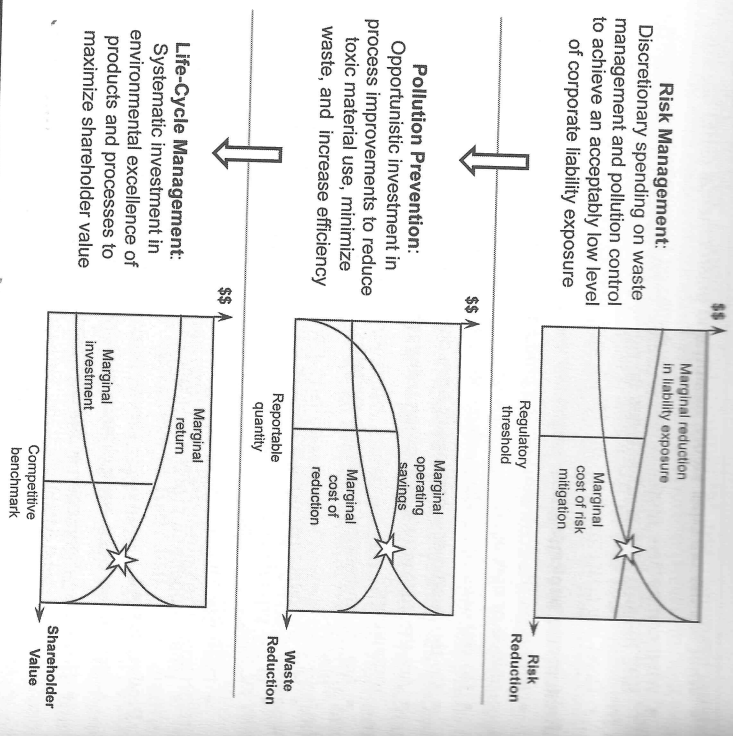


Figure 4.2 The paradigm shift in environmental management decision making.

This approach may lead companies to move "beyond compliance"; for example, if there are significant residual risks associated with emissions that are exempt or below the regulatory threshold.

- Under the pollution prevention paradigm, companies are largely concerned with identifying opportunities for improving efficiency while reducing waste and emissions. On a case-by-case basis, they will invest in pollution prevention opportunities to the extent that the next marginal dollar of expenditure does not exceed the corresponding savings in operating costs. Eventually, they will reach a point of diminishing returns where it is not cost-effective to continue reducing waste using existing technologies. However, new product and process technologies may change the economics to the point where zero waste or closed-loop recycling is attainable.

- Under the life-cycle management paradigm (see Chapter 10), companies are largely concerned with assuring environmental excellence and stakeholder satisfaction over the full life cycle

of their products and facilities. This leads them to move from an opportunistic approach to a systematic approach, with environmental considerations factored into virtually all decisions. In fact, environmental decision making is no longer a separate exercise—it becomes an integral part of business decision making. These companies will invest in environmental technology and performance improvements, to the extent that they earn an adequate return on investment. If they are able to leverage their skills and technologies to profitably achieve superior performance, environmental or otherwise, this will constitute a competitive advantage.

The life-cycle management approach leads naturally to the practice of DFE in the context of marketing innovation and new product development, while also incorporating the traditional risk management concerns associated with environmental health and safety. Companies that create value by leveraging their creativity and environmental insights have found the experience rewarding in many ways—intellectually, emotionally, and financially.

Pathways to Value Creation

Corporate sustainability commitments should not be based on citizenship alone. Every company that has invested substantial resources in sustainability improvement has done so because of a persuasive business case. The drivers of business value relevant to DFE include productivity, profitability, enhanced reputation, and competitive advantage. Short-term economic drivers are often the catalyst, and there is no question that rising energy prices have helped to motivate companies to take a harder look at their resource efficiency. But besides contributing to the bottom line, sustainable business practices create shareholder value by strengthening intangible factors such as brand equity, reputation, and human capital.

A significant driving force for corporate sustainability has been the World Business Council for Sustainable Development (WBCSD), mentioned in Chapter 2, a Geneva-based consortium of over 150 leading companies [6]. WBCSD has published a series of studies that demonstrate the business value of sustainable practices and present agendas for change in industries such as pulp and paper, mining, cement, transportation, and electric power. WBCSD has also been instrumental in developing tools and best practices for eco-efficiency and environmental footprint assessment. Like many other organizations, WBCSD conceives of the goals of economic, social, and ecological well-being as a "triple bottom line" that expands upon the financial bottom line [7]. The three elements can be defined as

- Economic prosperity and continuity for the business and its stakeholders,
- Social well-being and equity for both employees and affected communities,
- Environmental protection and resource conservation, both local and global.

This metaphor has been used as the basis for many sustainability assessment tools including the GRI guidelines and the Dow Jones Sustainability Indexes.

In the U.S., corporate environmental, health and safety excellence has been the principal goal of the Global Environmental Management Initiative (GEMI), a consortium of over 40 multinational companies that collaborate closely on codification of best practices [8]. Since 1990, GEMI has developed and published a series of studies that provide guidance to corporations on environmental management practices, including climate and water strategies, performance measurement, and supply chain management. The SD Planner™ tool developed by GEMI provides a concise summary of the key elements of sustainability, shown in Table 4.2, which synthesizes the multitude of principles and codes of conduct discussed in Chapter 3.

Category	Element	Definition
Social	1. Employee Well-Being	Protecting and preserving the fundamental rights of employees, promoting positive employee treatment, and contributing to employee health, safety, dignity, and satisfaction.
	2. Quality of Life	Working with public and private institutions to improve educational, cultural, and socio-economic well being in the communities in which the company operates and in society at large.
	3. Business Ethics	Supporting the protection of human rights within the company's sphere of influence and promoting honesty, integrity, and fairness in all aspects of doing business.

Table 4.2 Elements of Sustainable Development [8]

Category	Element	Definition
Economic	4. Shareholder Value Creation	Securing a competitive return on investment, protecting the company's assets, and enhancing the company's reputation and brand image through integration of sustainable development thinking into business practices.
	5. Economic Development	Building capacity for economic development in the communities, regions, and countries in which the company operates or would like to operate.
	6. Environmental Impact Reduction	Minimizing and striving to eliminate the adverse environmental impacts associated with operations, products, and services.
Environmental	7. Natural Resource Protection	Promoting the sustainable use of renewable natural resources and conservation and sustainable use of nonrenewable natural resources, including ecosystem services.

Table 4.2 Elements of Sustainable Development [8] (continued)

One of GEMI's major contributions has been to establish a business case for sustainability, including an understanding of how *intangible value drivers*, such as leadership, brand equity, and human capital, create shareholder value. Intangibles include people, relationships, skills, and ideas that add value but are not traditionally accounted for on the balance sheet. It is estimated that between 50% and 90% of a company's market value can be explained by intangibles rather than traditional measures, such as earnings and tangible assets [9]. As shown in Figure 4.3, there are three major pathways whereby sustainability contributes to shareholder value.

1. Sustainable business practices can contribute directly to **tangible financial value** by enabling top-line growth, reducing operating costs, conserving capital, and decreasing risks. For example, DuPont plans to expand into new markets by developing products that focus on human safety and personal protection (see Chapter 13). Many companies are implementing GHG emission reduction programs that will also reduce energy costs.

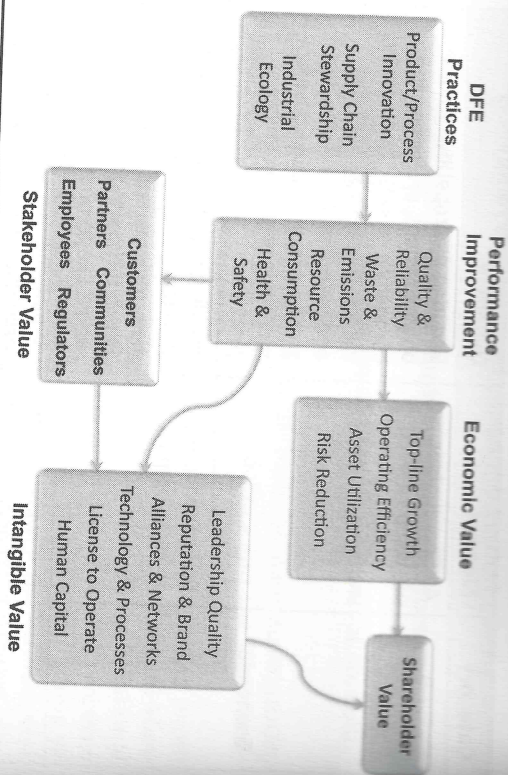


Figure 4.3 Pathways to shareholder value through environmental performance improvement.

2. Sustainability can directly improve **intangible assets** such as reputation, brand equity, strategic alliances, human capital, and innovation. For example, Xerox's pioneering efforts to design products for reverse logistics and asset recovery have both improved its manufacturing technologies and strengthened its customer relationships (see Chapter 11).
3. Sustainability can provide strategic advantage by creating **value for stakeholders**. Each company can choose to focus on the stakeholder issues that are best aligned with its own interests and core competencies. For example, Procter & Gamble has focused its sustainability efforts on creating innovative products that address worldwide needs for water, health, and hygiene (see Chapter 16).

Shareholder value is driven by a combination of Economic Value, corresponding to financial performance, and Intangible Value (see sidebar). Past efforts at building a business case for sustainability have focused mainly on estimation of financial returns associated with EH&S initiatives, such as converting wastes into by-products. However, these contributions tend to be incremental in nature, and are generally seen as tactical rather than strategic. The more strategic contributions of sustainability tend to be associated with nonfinancial value drivers, such as relationships and reputation, which provide a prospective, rather than retrospective, view of shareholder value. To portfolio managers and investment analysts, these intangible strengths are often the hidden clues that differentiate companies with comparable financial statements. In other words, improvements

in environmental and social performance can strengthen a company's intangible assets in ways that lead to sustained long-term shareholder value.

The third pathway, creating value for stakeholders, is especially important to consider. As shown in Chapter 3, the demand for greater transparency and improved corporate governance has led to an increase in voluntary disclosure, as well as greater scrutiny from major investors. In addition to customers, shareholders, and employees, there is a broader collection of external stakeholders that can influence the success of a business and are interested in environmental performance. These include suppliers and business partners; regulators and government officials at the local, state, and federal levels; neighboring communities; religious groups, advocacy groups and other NGOs; academic and research organizations; and, of course, the media (see Table 3.1). By responding to the diverse interests of these stakeholders, companies can strengthen their key relationships, reputation, and license to operate.

Figure 4.3 can serve as a template for companies to identify high-priority pathways whereby DFE efforts can deliver shareholder value. For example, one of the most important intangible assets is the ability to attract talent. A Stanford University survey of about 800 graduating MBAs at 11 top business schools has shown that these future business leaders rank corporate social responsibility high on their list of personal values and are willing to sacrifice a significant part of their salaries to find a similarly minded employer. Another important intangible asset is brand equity, and it is no accident that the top companies on Interbrand's list of the most valuable brands—Coca-Cola, IBM, Microsoft, GE, Nokia, Toyota, Intel, McDonalds, Disney and Google—have all invested considerable effort in developing sustainability programs.

Components of Shareholder Value

The components of Shareholder Value shown in Figure 4.3 merit closer examination. Economic Value can be measured on an annual basis through the following commonly used formula.*

$$\text{Economic Value Added (EVA)} = \text{After-tax operating profit} - \text{Capital charge}$$

The basic concept is that additional value is created either by increasing cash flow or by reducing the capital required to

*Some chief financial officers prefer to replace after-tax operating profit with related measures such as earnings before interest, taxes, depreciation and amortization (EBITDA) or return on net assets (RONA).

Components of Shareholder Value (continued)

generate cash flow. Conversely, value is destroyed by a decrease in cash flow or an increase in capital requirements. Note that the "bottom line," corresponding to the profit and loss statement, is just one part of the EVA equation. The other part is concerned with capital and corporate assets, reflected in the balance sheet.

Figure 4.4 breaks down these two terms, indicating how environmental excellence can contribute to value creation. After-tax operating profit can be improved either by increasing revenues or by reducing costs. Capital charge can be reduced either by managing assets more effectively or by decreasing the weighted average cost of capital (WACC) through favorable financing rates. Accordingly, DFE practices can deliver four major types of tangible value creation:

1. **Top-Line Growth:** DFE contributes to increased revenues through environmentally preferred product differentiation, improved license to operate in existing markets, or penetration of new markets. In addition, the practice of concurrent engineering helps to reduce cycle time for new product development which leads to earlier introduction and increased market share.
2. **Operating Efficiency:** DFE applied to manufacturing and supply chain technologies leads to leaner and cleaner processes, resulting in greater productivity and lower operating costs. Resource conservation and recovery help to reduce material and energy costs, as well as

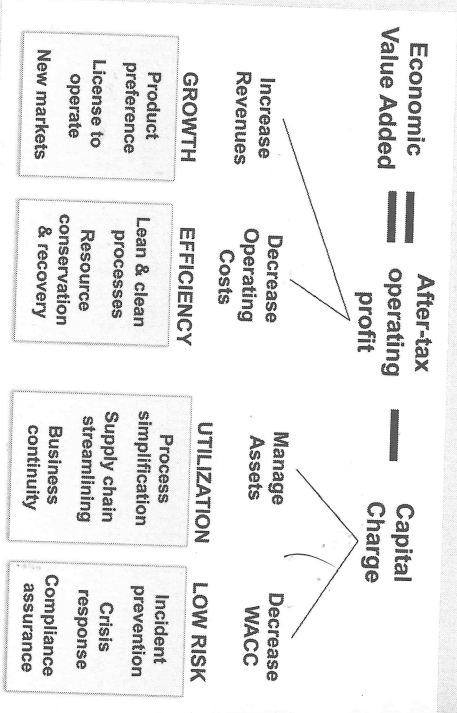


Figure 4.4 Economic value creation opportunities.

Components of Shareholder Value (continued)

waste disposal costs. Other indirect benefits of DFE include reduced insurance premiums and training costs (see Life-Cycle Accounting in Chapter 9).

3. **Asset Utilization.** DFE can reduce the complexity and fixed costs of assets through process simplification and streamlining of the supply chain. In addition, DFE can improve the utilization of assets through increased business continuity and equipment reliability, thus reducing the total asset base required to support the business.

4. **Risk Reduction.** DFE can help to reduce overall enterprise risk, which is the main driver of WACC. Prevention of incidents that may lead to business interruption, improved responsiveness to crises, and assurance of regulatory compliance all contribute to lowering both the actual and perceived risks associated with business operations.

Intangible value is less amenable to precise quantification, but a number of studies have actually measured the strength of intangibles across a variety of industries. Based on considerable research, the following characteristics depicted in Figure 4.3 have been identified as among the most important intangible assets [10].

- **Leadership Quality:** Management capabilities, experience, vision for the future, transparency, accountability, and trust.
- **Reputation:** How the company is viewed globally in terms of stakeholder concerns, inclusion in "most admired company" lists, and sustainability performance.
- **Brand Equity:** Strength of market position, ability to expand the market, perception of product/service quality, and investor confidence.
- **Alliances and Networks:** Customer and supply chain relationships, strategic alliances and partnerships.
- **Technology and Processes:** Strategy execution, information technology, inventory management, flexibility, quality, and internal transparency.
- **License to Operate:** Regulatory positioning, relationships with local communities, ability to expand operations.
- **Human Capital:** Talent acquisition, workforce retention, employee relations, compensation, and perception as a "great place to work."

The : Sustainability Landscape

While the logic of shareholder value creation is compelling, it is not necessarily a sufficient motivation to break old habits. Many forces of change in the business environment have converged during the late twentieth and early twenty-first centuries, resulting in a sort of "tipping point" for adoption of corporate sustainability. Most of these changes have been discussed in previous chapters, and are summarized here:

- **Climate change anxiety.** Once climate change was finally acknowledged as a reality, governments, NGOs, and corporations began to seriously explore policies and technological solutions for mitigation of greenhouse gas emissions; and carbon offset schemes flourished.
- **Energy security.** Concerns over depletion of fossil fuels and dependence on imported petroleum, coupled with the problem of carbon emissions, drove investments in alternative fuels; this trend was further intensified by a sudden rise in oil prices in 2007.
- **Customer awareness.** Both retail and industrial customers became increasingly concerned about the environmental performance of products that they purchased. Major corporations began to systematically review the environmental performance of their suppliers, and many governments introduced environmentally preferred procurement policies.
- **Legislative requirements.** A series of government directives in the European Union forced global multinationals to change their practices with regard to product design and life-cycle management; similar measures were adopted in many other countries.
- **Voluntary codes and standards.** Voluntary codes of conduct such as the Ceres principles, as well as environmental management system standards such as ISO 14001, were widely adopted by the business community as a way to demonstrate environmental responsibility.
- **Eco-labeling programs.** A number of eco-labeling initiatives have gained acceptance by consumers around the world, and companies in the electronics, consumer products, food and beverage, and other industries are now compelled to qualify in order to remain competitive.
- **Sustainability-driven investing.** The financial investment community has begun to recognize sustainability as an indicator of overall superior management, as exemplified by the increasing interest in the Dow Jones Sustainability Indexes and other rating systems.

- **Globalization.** Rapid economic growth in emerging economies, such as Brazil, Russia, India, and China (known as BRIC), as well as globalization of supply chains, have forced multinational companies to grapple with the challenges of energy, environmental protection, human rights, poverty, and social responsibility.

- **Transparency.** Public expectations for information disclosure, as well as the explosive growth of electronic communication, have made it essential for global companies to increase their level of accountability, transparency, and stakeholder engagement.

Given all these changes, it is clear that corporate sustainability is not just altruism. Rather, it is an enlightened response to emerging market forces. Instead of merely listening to the voice of the individual customer, companies are beginning to listen to the collective voice of the larger Customer, namely, human society. Because of the great impact that multinational companies can have on society and the environment, stakeholders expect them to do business in a socially and environmentally responsible manner. This landscape creates opportunities for companies to respond to stakeholder expectations with new technologies, products, and services. The potential role of DFE is evident—enabling companies to simultaneously increase shareholder value and meet the needs of their stakeholders, thereby gaining competitive advantage.

Those companies that recognized these trends and became early adopters have established highly visible and successful sustainability programs. Typically, there are several levels of sustainable business practices. The most basic level involves corporate initiatives, such as philanthropic programs aimed at solving community social problems. The next level often involves reducing the "ecological footprint" associated with the product life cycle, including manufacturing, use, and end-of-life disposition. The most challenging level involves enhancing the *trihent social value* created by the firm's operations, products, and services, which may range from assuring human health and nutrition to stimulating consumer education and growth of new businesses. At this level, challenging trade-offs may arise—for example, balancing job creation and economic development against community concerns about industrial pollution and environmental justice, i.e., equitable distribution of risks and benefits.

Rather than following a "cookie-cutter" approach, the early adopters have explored how they can integrate sustainability into their own business innovation strategy. Electronics companies have used information technology to bridge the digital divide between haves and have-nots,

**CORPORATE
SUSTAINABILITY IS AN
ENLIGHTENED RESPONSE
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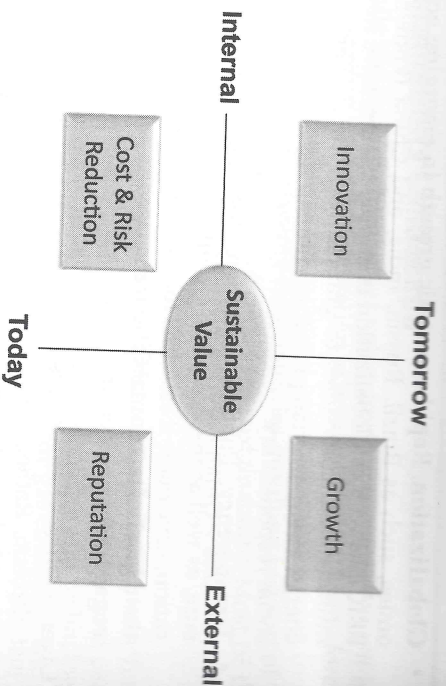


Figure 4.5 Framework for corporate sustainability strategy development [11].

consumer products companies have dramatically reduced packaging to minimize solid wastes, chemical companies have invented new processes to eliminate the use of toxic substances, and so forth. Part 3 of this book elaborates on these stories and many more. The common purpose of all of these programs has been to shift enterprise operations from a traditional, resource-intensive, and volume-maximizing business model to a more eco-efficient, socially responsible, and value-maximizing model. This shift aligns nicely with the goal of increasing shareholder value by raising profits while reducing the use of capital and resources—i.e., “doing more with less.”

Looking to the future, Stuart Hart and Mark Milstein have developed a useful framework, shown in Figure 4.5, to characterize the strategic landscape that companies face in their search for sustainable value creation [11]. The different quadrants of this framework echo many of the themes discussed in this chapter. The lower left quadrant represents a traditional short-term focus on internal cost and risk reduction, which is a necessary part of doing business. The lower right quadrant is also concerned with short-term sustainability but is outwardly directed toward stakeholder engagement and protection of the firm’s reputation. The upper left quadrant represents a focus on innovation to assure that the firm is positioned to meet future demands for sustainable technologies, products, and services—this is the main thrust of DFE. Finally, the upper right quadrant involves external engagement to understand growth opportunities and market needs, which provides critical feedback to the innovation process. Achievement of global sustainability is dependent on the ability of companies in every industry to balance these strategic thrusts, creating shareholder value for themselves while assuring the continued well-being and prosperity of human societies.

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