

Sustainability, Eco-Efficiency, Life-Cycle Management and Business Strategy¹

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This article outlines some of the rationale for integrating environment and sustainability issues into core business practises and provides some guidance on how companies can begin to take a strategic view when selecting environmental management tools. Two of these tools, life cycle management and eco-efficiency, are outlined in brief.

Real sustainability is about simultaneously being profitable and responding to the reality and the concerns of the world in which you operate

John Browne,
Group Chief Executive,
British Petroleum (BP America)

The environment is an increasingly competitive issue. In North America this trend is not based on an increased market demand for "green" products. The primary drivers in the North American market are costs, risk reduction, innovation, efficiency, and regulatory pressures. In comparison to Europeans, North American (NA) consumers and investors have been slow to select "green" products and reward companies who produce and market environmentally superior goods.

The competitive nature of environmental issues has been catalyzed by a shift in the focus of the NA attitudes toward environmental matters. The environmentalists versus industrialists debates of the 1970s and 1980s are gradually being replaced by solutions-oriented approaches. These new approaches often involve multiple stakeholders working together to solve complex environmental challenges.

This shift toward solutions has opened up a world of possibilities for companies that add environmental performance to their traditional concerns for quality, service, and cost. The simple fact is that if you make products with less energy, less materials, and less pollution, you save money. Leading companies have

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embraced this truth and have devised a variety of strategies and tools to improve the environmental performance, and consequently the economic performance, of their operations and products. Many of these companies are now going beyond environmental performance and are now beginning to discuss sustainability. Sustainability pushes the environmental envelope and challenges companies to consider issue such as the environmental impact of the materials they select, the social implications of their products and operations, and in some case the need for their product at all.

Managers who wish to integrate environmental and sustainability concerns more systematically into their companies face a number of challenges. These challenges are similar to the ones faced by managers in the early days of the quality movement. They include the development of a common vision and strategy, the selection of the management systems and tools, and the collection of the right data. Critical to the effective integration of environmental and sustainability issues is setting appropriate goals and developing performance measures that identify if the company is moving in the right direction with respect to implementation.

SUSTAINABILITY AND BUSINESS TRENDS

The business climate of the 21st century will be characterized by increasing globalization, revolutions in information technology, rapid process and product innovations, and chaotic marketplace demands.² There will also be massive organizational restructuring, rationalization and consolidation across all manufacturing sectors as competing companies attempt to manage growth (forward and backward integration). Furthermore the marketplace will be profoundly changed by a predicted population increase of 4 billion by the year 2040.

These changes will result in a rethinking of business strategies in the 21st century to focus on how companies deliver higher value products and services to their customers. According to Robert Reich, former economic advisor to Bill Clinton, the economy of the next century will be characterised by *a decrease in the material and energy content of products and an increase in the knowledge content.*

All this will take place on a planet that is, in the minds of many leading thinkers and decision makers, already reaching ecological limits in critical areas such as food production, freshwater supply, ozone layer depletion, and climate change. The challenge for industry, governments, and individuals will be to ensure that continued economic development and social well being are compatible with

² EKOS International, Gil Friend and Associates, Timothy O'Shea & Co. (1996, June) Business driven sustainable development (Executive Study Mission to Sweden and the Netherlands). Seattle,: EKOS International

ecological support systems. Achieving this objective requires a dramatic improvement in resource utilization and productivity.

This situation is creating real pressure on companies to move toward more sustainable, “eco-efficient,” forms of production. Direct pressure comes in the form of customer demands, expanded notions of board of director liability, and regulatory pressures (increasingly from supplier requirements, and product and material take back regulations).³ In some cases these pressures are creating direct product and material bans. There are also competitive pressures arising as many companies are beginning to view eco-efficiency as an opportunity for identifying product and process improvement opportunities and demonstrating environmental performance to downstream customers and government agencies. In a sense they are recognizing, and taking advantage of, the environmental value of their product or service.

There is a growing awareness in the financial community that companies that are strong environmental performers may be a better investment. Evidence suggests that companies with strong environmental management are well managed overall and are more aware of the business and environmental “climate” in which they operate. According to Carlos Joly, former Investments Chief at UNI Storebrand Norway and now with Monsanto, “companies that are eco-efficient are also to be financial winners.”⁴

In addition to increasing resource productivity and considering the environmental compatibility of products and product systems, sustainable development also demands consideration of the social aspects of the industrial system. Many companies are dealing effectively with the economic and environmental aspects of their operations and products; however, very few have started the more difficult task of addressing the social dimension of their business. There are clear indications that social issues are gaining importance and companies can expect similar information demands (corporate reporting, performance measures) to what is now expected in the area of environmental performance.

INDUSTRY AND GOVERNMENT RESPONSES

The increasing focus on sustainability has its roots in the 1987 report of the World Commission on Environment and Development (Our Common Future) and the 1992 UN Conference on Environment and Development (UNCED) held in Rio de Janeiro. Our Common Future set out a vision for sustainable development that integrated economic, social, and environmental concerns. The UNCED conference took this vision and translated it into a series of actions for governments around the world. At UNCED, governments made a formal

³ McClay, Brian. (1997). Eco-efficiency: More with less is not enough. In The GPC Environment Report. (Vol 5., Number 4). Ottawa: Government Policy Consultants.

⁴ Tomorrow: Global Environment Business. (1996, September). 6(5).

commitment to develop and promote more sustainable forms of consumption and production.

Since UNCED, national governments and international organizations have been steadily developing policies, regulations, and guidance documents to promote sustainable development. Activity targeted toward industry, they include the promotion of cleaner production methods, product stewardship initiatives, extended producer responsibility programs, environmental management standards, as well as green procurement and eco-labeling programs.

In the private sector, there has been an even greater level of activity as companies have begun to translate the environment from a marginalized management concern into a core issue that relates directly to efficiency and competitiveness. Leading companies are going beyond compliance to embed environmental and sustainability issues into their core business practices. Numerous case studies have demonstrated that this approach can result in the following benefits:

- reductions in operating costs;
- production and process improvements;
- reduced liability and risk;
- enhanced brand image;
- increased employee morale;
- increased opportunity for innovation;
- increased opportunity for revenue generation -- new markets and price premiums;
- better supply chain management; and
- better relationships with customers.

The achievement of these benefits has been facilitated by an explosion of concepts and tools to assist companies in moving toward more sustainable forms of production (see Exhibit 1). From a business perspective, two concepts receiving a lot of attention lately are eco-efficiency and life-cycle management. These concepts are introduced below.

Exhibit 1: Tools and management systems to support SD in industry

Cleaner Production Guides
Corporate Environmental Reporting
Design for Environment
Design for Disassembly
Eco-compass
Eco-auditing
Eco-efficiency
Eco-industrial Parks
Eco-profiling
Environmental Auditing
Environmental Management Systems
Environmental Performance Measures
Life-Cycle Assessment
Life-Cycle Costing
Life-Cycle Management
Life-Cycle Value Assessment
Pollution Prevention
Product Stewardship
Social Justice Indicators
Responsible Care
Standards -- ISO 14000 and various national environmental standards
Supply Chain Management
System Conditions of the Natural Step

ECO-EFFICIENCY

The key to success is strategy. We can design not only for the environment, but also for economic advantage. Eco-efficiency is one way to look at this.

David Buzzelli
Dow Chemical

Popularized in 1992, at the UNCED conference, by the Business Council for Sustainable Development (now the WBCSD), eco-efficiency has become a key strategy for business to evaluate and improve the environmental performance of their operations, products, and services. The WBCSD states:

Eco-efficiency is reached 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, through the life cycle, to a level at least in line with the Earth's carrying capacity.⁴

This is achieved through improvements to the material and energy efficiency of products, reductions in environmental and human health-related risk, designing products that “fit” into ecological cycles and are easily disassembled and recycled, and extending the durability, service life, and functionality of products.

A key feature of eco-efficiency is that it harnesses the business concept of creating value and links it to environmental management. In essence, the WBCSD does not differentiate between a competitive company and an eco-efficient company. This viewpoint is reinforced by a recent ICF Kaiser study demonstrating that companies can improve both shareholder value and environmental performance by investing in environmental management.⁵

Exhibit 2. Seven elements to eco-efficiency

- Reducing the material requirements for goods and services
- Reducing the energy intensity of goods and services
- Reducing toxic dispersion
- Enhancing material recyclability
- Maximising sustainable use of renewable resources,
- Extending product durability
- Increasing the service intensity of goods and services

Source: World Business Council for Sustainable Development (WBCSD). (1995). *Eco-efficient leadership for improved economic and environmental performance*. Geneva: WBCSD

At a recent forum, held to discuss the Eco-efficiency Indicators Pilot Project being conducted by the National Round Table on Environment and Economy and seven NA companies, the relationship of eco-efficiency to corporate governance was discussed. Jim Goodfellow, of Deloitte & Touche, observed that the newly expanded view of corporate governance will increasingly require board of directors to have information on the environmental and sustainable development aspects of companies, their operations, products, and services. In fact, the responsibility of board of directors to monitor and understand these issues is

growing and to some extent is already entrenched (for example in the Toronto Stock Exchange definition of corporate governance).⁶

LIFE-CYCLE MANAGEMENT

Life cycle management is an essential, yet visionary, strategy that every ComEd business unit can embrace in the fight to aggressively reduce costs and enhance revenues.⁷

Lou DelGeorge
Vice President
Commonwealth Edison (ComEd)

Inherent in the shift toward more sustainable and eco-efficient forms of production is the concept of life-cycle management. Life-cycle management is an integrated approach to minimizing the environmental burdens, risks, and costs associated with a product or service over its life cycle.

The emergence of the lifecycle perspective has had a profound impact on how companies are judged with respect to environmental performance. Until recently a progressive company was seen to be acting responsibly if it managed the environmental aspects of its own operations (e.g., compliance with regulations, having an enforcement management system (EMS), producing information on environmental performance). Increasingly the marketplace and regulators are demanding that companies not only control the management of their own operations but also the management, or stewardship, of the upstream and downstream resource and environmental issues associated with their materials, products, or services.

The good news is that a strategic approach to life cycle management contributes directly to a company's economic and environmental performance. Used effectively a life-cycle management approach can help a company:

- Develop a disciplined management approach for strategic decisionmaking and companywide policy setting. For example identifying which stage in the company's supply chain and operations are the greatest contributors to issues such as global warming, persistent organic pollutants, acid rain, and endocrine disrupters.
- Identify economic or other business benefits such as reduced internal costs, increased sales and revenues, focused market support, product improvement, and product innovation.
- Develop objective and scientifically sound information for external communication of environmental information (e.g., corporate environmental reports) and tracking of progress toward environmental objectives and targets.

LIFE-CYCLE MANAGEMENT AND ECO-EFFICIENCY IN PRACTICE

Applications of life-cycle management techniques and eco-efficiency tools are varied. Examples include:

Dow Europe (chemicals) has used a life-cycle management approach to direct investments and as a basis for their eco-compass. Their objective in using tools such as the eco-compass is the development of products with high customer value and positive contributions to sustainable development.⁸

ComEd (nuclear, fossil generation, and commercial operations) saved \$75 million (U.S.) in the first three years of its life-cycle management program. Savings came primarily from better asset management. Projects were initiated across the organization and savings came from areas such as transformer refurbishment, better coal ash marketing, reductions in radioactive waste, and office furniture utilization.

At Chrysler Corporation life-cycle management is used to expose and manage the hidden costs of regulated substances. These costs are estimated at \$2.5 Billion U.S. over a five-year period and they include liability, training, medical testing, lost opportunities in recycling, disposal, need for overdesign, etc. According to Bob Kainz who heads up Chrysler's LCM program these costs "come at you in pennies, nickels, and dimes". The LCM program at Chrysler is focused on identifying and eliminating these costs through better management of suppliers.⁹

Bristol-Myers Squibb (BMS) conducts product life-cycle (PLC) reviews of all major product lines. This approach is the cornerstone of BMS's prevention-based environment, health, and safety (EHS) activities. The company was able to identify and reduce negative EHS impacts throughout all phases of a product's life, from research to final disposal. BMS has identified potential savings of more than \$6.5 million in product and process improvement opportunities through this work. The PLC reviews that have been completed resulted in cost savings opportunities averaging \$340,000 per review.¹⁰

Neste has used life-cycle tools to support its product stewardship initiatives for a number of years. They carry out LCA of new and existing products and have used a life-cycle management approach to demonstrate the environmental benefits of their reformulated gasoline, diesel, and light fuel oil. According to Neste the production of cleaner gasoline and diesel fuels is part of their eco-competitiveness.¹¹

Alcan Aluminium (metals and mining) has used life-cycle data to identify improvement opportunities throughout their operations, to support the

development a progressive approach to the climate change issue, and to demonstrate the environmental value of their product to their customers (e.g., the automotive sector worldwide).¹²

Volvo (automotive) has integrated a life-cycle perspective into activities such as product design, supplier management, and material selection. Recently life-cycle assessment was used to develop data for environmental indicators contained in the environmental product declaration (eight-page environmental label) for their new S80 vehicle. Life-cycle data is used to support indicators related to the manufacture, use, and end-of-life disposal of the S80 automobile.¹³

For these companies, life-cycle management and eco-efficiency are effective tools for integrating environmental and business decision making. They have broadened their outlook on environmental management beyond the plant gates to include the supply chain and have realized real and direct business benefits.

THE BUSINESS OPPORTUNITY

The examples above illustrate that there are long-term strategic and competitive advantages to be gained by understanding and capitalising on the global necessity to move toward more sustainable forms of production. Leading corporations are using sustainability, eco-efficiency, and life-cycle management as levers to develop a better understanding of the economic and environmental value of their products -- and to identify cost reduction and product improvement opportunities.

These companies are preparing for what many analysts (e.g., Gil Friend, Paul Hawken, Wuppertal Institute, the Factor 10 Club) are calling for, that is, a factor 10 or more improvement in resource productivity over the next 30 to 50 years. These analysts argue that the consequences of increasing natural resource consumption and population growth must be addressed, in part, by achieving a ten-fold increase in the efficiency with which we use energy, natural resources and other materials.¹⁴ They also call for a revamping the tax and subsidy systems to decrease the relative cost of labour (i.e., tax resource consumption, not work).

By recognizing these long-term trends and taking the necessary steps to understand and implement sustainability, eco-efficiency and life-cycle management companies can:

- develop deeper relationships with customers and suppliers;
- differentiate their products in the marketplace;
- open up new markets;
- enhance brand image and community relationships; and
- stay out in front of, or, in some cases, influence regulations.

Capitalizing on the business opportunity is not a given, it requires a strategic approach. Recent surveys indicate that organizations decide whether and to what degree they want to be “green.” Compliance with environmental regulations is imperative. The difficult decision involves determining the level at which an organization will proceed beyond environmental compliance. To address this issue, five levels of environmental strategy can be considered as follows¹⁵:

Compliant. An organization decides it will be in compliance with all environmental, health, and safety regulations. This is the minimum level of environmental strategy an organization can adopt.

Informed. An organization is in compliance and participates in external activities such as trade associations. It spends time and resources collecting information.

Market-Driven. An organization responds not only to regulatory requirements, but also is reactive to its customers’ environmental expectations by providing leading product/ service and operational performance.

Competitive Advantage. An organization is not only in compliance, but understands its environmental market opportunities and proactively uses that knowledge to create markets where it has sole or leadership market positions.

¹⁵ Fava, J., Agis, V., Nudy, L., Steinmetz, D., Haaf, W., Haden, R., Sylvester, R., Sneath, R., Lopez, L., Becker, D., Maher, K., Weiler, E., Kusz, K.U. (1998). A flexible framework to select and implement environmental strategies. *Journal of Strategic Environmental Management*, 1(1).

Exhibit 3. Environmental Performance and Shareholder Value

Recently the WBCSD convened a working group of 40 business and financial experts to examine the relationship between environmental performance and shareholder value. Among their findings:

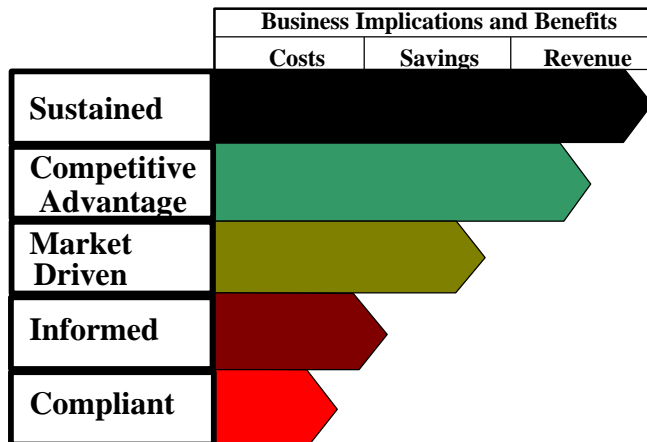
- environmental drivers can provide competitive advantage to any company;
- environmental issues can drive financial performance; and
- the quality of a company’s environmental management is a good indicator of the overall quality of its business management.

Source: World Business Council for Sustainable Development (WBCSD). (1998). *Environmental performance and shareholder value*. Geneva: WBCSD

Sustainable. An organization proactively integrates economic growth; environmental, health, and safety; and social well-being into its operations for competitive advantage and long-term viability.

The relationship between business implications/benefits (e.g., efficiency compliance, liability reduction, cost savings or avoidance, and revenue generation) and environmental strategy is shown in Exhibit 4.¹⁶

Exhibit 4: Business Implications and Benefits of Different Environmental Strategies



As an organization moves from a compliant strategy to a sustainable strategy, different implications and benefits result. For example, a compliant strategy is viewed as a cost, and the only strategic elements addressed are often how to reduce the cost of compliance. In a market-driven strategy, an organization has integrated pollution prevention and additional customer or market considerations into their business, which result in cost savings and/ or cost avoidance. In the competitive advantage or sustainable strategies, revenue generation may be realized as a result of using the environment from a strategic perspective to identify new business opportunities.

Understanding the environmental strategy level a company is currently at is a key first step in choosing and implementing the appropriate management systems, techniques, and information systems. Understanding the different levels of strategy can also help a company capitalize on opportunities to move up a level if their markets or internal objectives change. For example, a number of companies have collected life-cycle data for purely defensive or market driven needs and then realized that this information can be used for other more strategic purposes.

¹⁶ Id.

SUMMARY AND RECOMMENDATIONS

The global trend toward products and materials that consume less energy, less materials, and release fewer pollutants is intensifying rapidly. Many companies are in the process of deciding on how and when to respond to this trend. These companies are using life-cycle management and eco-efficiency tools to strategically and proactively manage product issues while, at the same time creating business benefits by reducing costs and opening up business opportunities. To keep pace companies should:

- Build awareness within their management team to better understand the relationship between sustainability, eco-efficiency, life-cycle management, and their core business activities.
- Based on an analysis of regulatory, market, and environmental trends make a strategic choice on the environmental strategy they wish to pursue.
- Conduct a systematic gap analysis among current environmental management activities, eco-efficiency and life-cycle management approaches.
- Begin to identify and implement the necessary management systems, programs, and data collection efforts needed to achieve the chosen environmental strategy.

By taking these steps, a company can begin the process of systematically addressing the environmental and sustainability aspects of their operations and products. It should be understood that these actions are really only a minimum level of activity. A growing body of evidence suggests that societal demands for companies to produce environmentally and socially responsible products will increase in the 21st century. By taking early action, a growing list of companies are building platforms from which they can develop the innovative products needed to address the future demands of the market and society.

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