



## Eco-efficiency

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# Eco-efficiency

## The Business Link to Sustainable Development

Livio D. DeSimone and  
Frank Popoff with the  
World Business Council for  
Sustainable Development

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## Foreword

Maurice Strong

It is a very special honor to have been invited to provide the foreword to *Eco-efficiency: The Business Link to Sustainable Development* by Livio DeSimone and Frank Popoff, two executives recognized for their leading-edge thinking on issues of sustainability.

Back in 1992, I had the unique experience of being present at the creation of the concept of eco-efficiency during the Earth Summit. In just five years, eco-efficiency has moved from a vision to implementation. Discussed in board rooms, debated by policy makers, and promoted by NGOs, it is an idea whose time has not only come but one whose contribution will help society move along the path to sustainable development.

As both a businessman and now an international public servant, I have first-hand experience of the exciting and important potential eco-efficiency provides. The worldwide adoption of eco-efficiency by governments and the widespread practice by business is just under way, but all those who are experiencing it know how fundamental it is becoming to how we think and act about sustainable development.

Evidence of the evolution of eco-efficiency from concept to concrete action is growing day by day:

- Eco-efficiency workshops have been conducted in many parts of the world;
- UN agencies, the OECD, the European Commission, and many national governments are promoting awareness of eco-efficiency on all continents;
- the WBCSD global network is introducing the idea to developing countries and economies in transition;



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· and important manuals and managerial guides are being published by the business community.

Eco-efficiency is truly far-reaching. It can help developed countries improve their resource productivity, encourage developing countries to reach their full potential without depleting their material resource heritage, and provide governments with the essentials to develop innovative and pragmatic policies that energize and enable society to become sustainable.

In my current capacity as special advisor to the UN Secretary-General I can foresee the fundamental and crucial role eco-efficiency will play for today's generation to achieve a sustainable future. And that means it can help everyone individuals, businesses, and governments achieve responsible attitudes.

Weaving eco-efficiency into the very fabric of how businesses, governments, NGOs, and consumers think and act is essential if we are to reap the vast rewards of this concept and tool. Of course it will take time, but the progress we have achieved so far tells me we have every reason to be optimistic as to how quickly the idea will spread, how fast it will be implemented, and how much it will contribute

## Views of Business Leaders

*Samuel C. Johnson is chairman of S.C. Johnson & Son, Inc. (better known as SC Johnson Wax). Fortune has called him "America's leading corporate environmentalist, "for reasons that are clear from the company case study in chapter 6.*

"My grandfather once used a white-flannel test to sell the company's wax. After polishing and shining a customer's floor dressed in a smart white suit, he sat down and got them to pull him over the newly waxed floor. When he got up, his backside was clean, not a speck of dirt.

"My dream is to be able to conduct an environmental white-flannel test around our offices and factories to show that they operate behind a "clean" ethic while producing goods.

"We aggressively seek out eco-efficiencies ways of doing more with less because it makes us more competitive when we reduce and eliminate waste and risk from our products and processes. And it saves us money. By developing products that are as safe as possible for people and the environment, we improve our market share. Of course, we're making tough decisions all the time that weight the human positives of our products against their potential environmental impact. We're always looking for cleaner, greener solutions. This is going to become increasingly important as customers become more sophisticated and demanding in this regard.

"But our actions aren't just about business. When my grandchildren first saw the big snapping turtle in the pond where I used to play and fish as a boy, they glowed with the same wonder and awe as I did. Without sustainable development, it's going to be a less satisfactory planet for my grandchildren to live in. For me, those are the stakes."

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*Percy Barnevik, president and CEO of ABB Asea Brown Boveri, is often cited as Europe's most respected corporate leader. He has always placed great emphasis on taking early action to anticipate long-term trends, whether this be investing in transitional economies or taking the environment seriously (see ABB case study in chapter 6).*

"On the threshold of the twenty-first century, the earth is home to about 6 billion people striving to improve their quality of life. As our numbers continue to grow, there are few challenges as daunting as providing people in every part of the world with the tools they need to achieve their sustainable development goals.

"Energy both human energy and the energy we tap from nature drives development. Yet in many countries lack of electrical power hampers progress in agriculture, urban development, and industry. They need an abundant, affordable, and reliable power supply but with as minimal environmental impact as possible.

"Achieving this balance is among our top corporate priorities. Our products and systems boost efficiency and reduce emissions, from the largest power plants to the smallest electrical relay, from transmission lines stretching across entire continents to mass transit systems running across town, from pulp and paper mills to steel plants. We want people to know that, when they choose ABB products and services, they get technological excellence aimed at delivering high performance with low environmental impact.

"ABB believes that the innovative powers of entrepreneurial business can provide eco-efficient solutions to many of the world's environmental challenges. We intend to play an important role in meeting those challenges and in so doing to safeguard and develop our long-term prosperity."

*Erling Lorentzen is chairman of Aracruz Celulose, a \$2 billion turnover Brazilian producer of paper pulp which is setting world-class standards for sustainable production from natural resources. He also chaired a two year multi-stakeholder WBCSD study of the environmental impacts of the paper cycle, from forest to final disposal.*

"Living and working in Latin America gives a different perspective on sustainable development from Europe or America. You realize that

poverty is one of the world's leading polluters. That's why development is essential for sustainability because you can't expect people who don't eat a proper meal to be concerned about the environment. However, this development has to be eco-efficient so that we preserve our natural heritage and leapfrog some of the pollution problems experienced in the North.

"Our starting point is a good understanding of what our environmental impacts are. That's why we led the study on sustainable paper cycles. We have to get the facts whether good or bad on the table to elevate the debate to the highest level.

"Our study shows that paper can be sustainable and that companies moving in this direction will get a competitive advantage. There'll be fewer customers for the products of companies who aren't seen as environmentally progressive. The discipline of eco-efficiency also means that we're continually getting more productive in our use of resources. And the pride our staff have in our policies means higher morale and better performance from top to bottom of the organization."

*Tadahiro Sekimoto is chairman of the board of NEC Corporation. NEC established an environmental department in 1970 and has a reputation as one of the most environmentally progressive organizations in Japan.*

"We all know that environmental damage in one area may have grave consequences for not only the people who live there but the whole world. Such damage could even sow the seeds for the destruction of humanity. We sincerely believe that the global environment is a legacy for the entire human race. We have been trying to address this idea for the last ten years.

"Global environmental issues raise a contradiction between the needs of humanity and the earth. When people start achieving economic development and prosperity, energy consumption increases. This is a major cause of environmental deterioration, such as the greenhouse effect.

"If we approach the problem simply by protecting the earth's environment, we face the dilemma of having to sacrifice material wealth to achieve spiritual wealth. To tackle environmental issues, we need to understand how to overcome this dilemma. The basis for solving these issues exists in reconciling economic activities with planet earth. Our mission is to take up this challenge.

"Thus, we place our faith in human knowledge, and, in particular, the application of technology. We are committed to achieving sustainable development by providing environmentally conscious products, that is, pursuing eco-efficiency and contributing to society by fully utilizing our technological ability. We must tackle environmental problems with the belief that economic development and the global environment can coexist."

*Stephan Schmidheiny is chairman of several holding companies involved globally in high technology construction materials, retailing, marketing and services, real estate, housing, and forestry. He is the founder of the Business Council for Sustainable Development, a predecessor body to the World Business Council for Sustainable Development (WBCSD), and author of several books on business and sustainable development.*

"Eco-efficiency is plainly and simply the 'business end' of sustainable development.

"I want my various companies to be efficient overall. If they add a great deal of value to goods and services while using small amounts of resources and producing little or no waste and pollution, then they are efficient from an ecological point of view. In societies that appropriately punish waste and pollution, they will also be efficient from an economic and financial point of view. They will be highly competitive.

"Thus business leaders concerned with the quality of the planet on which their children will live, and with the 'total quality' and competitiveness of their companies, have a two-pronged eco-efficiency agenda. They will make their own enterprises eco-efficient. They will also work with other entrepreneurs to improve market conditions and policies so that markets reflect environmental as well as economic realities and thus reward the more eco-efficient firms."

*Björn Stigson is executive director of the World Business Council for Sustainable Development, the leading advocate for business on sustainable development issues (see Introduction).*

"The WBCSD has a special relationship to 'eco-efficiency' ever since Stephan Schmidheiny put this concept forward in his 1992 book *Changing Course*. It is both a management concept and a tool used by busi-

nessbut not exclusivelyto make measurable progress toward sustainability.

"Eco-efficiency catches at a glance the balance business strives toward: sound ecology and profitable operations. Quite simply, it is about doing more with less, and being environmentally responsible.

"As an evolving concept, it has shifted from 'resource productivity' to becoming a significant driver of innovation, underpinning the move from product to service, from individual to sectoral accountability and even beyond to governments and consumers who start recognizing its value.

"I am grateful to Dow and 3M for bringing together collective thinking and experience on this subject. It is an important step forward, yet not the ultimate. With our members, we will continue to set forth thoughts on how the practice of eco-efficiency can be enhanced through both voluntary action and enlightened government policies and incentives. Why? Because it makes good business sense and it is the right thing to do."

*John B. Maree, the chairman of Eskom, Africa's largest electrical utility, is one of southern Africa's most respected business leaders. For the past six years he has also stood firmly at the helm of the Industrial Environmental Forum of southern Africa signaling the commitment of corporate leaders to sound environmental management. John Maree acquired his love and understanding of the environment as a child on the great open plains of the Karoo, a harshly beautiful but fragile area deep in the heart of South Africa.*

"Sustainable development is an imperative in South Africa as we reconstruct our new democracy. It is now widely accepted that the top national priority is to stimulate capital investment, growth, and job creation. Without that we will not achieve a politically stable and equitable society.

"We must address the hopes and aspirations of the less privileged members of our society in practical ways. The changes taking place in our country must be seen to result in positive changes in their everyday lives.

"However, development must take due consideration of the constraints of our rich but fragile environmental base. Only through eco-

efficiency and the optimization of human, capital, and environmental resources will we be able to offer all our people and future generations the hope of a better quality of life.

"Eskom has striven to be a leading corporate citizen in all facets of its operations. It is committed to bringing electrical power to as many people as possible to stimulate development and education and raise the potential quality of life. We have already made good progress toward ensuring that schools, clinics, and other vital services are connected to reliable energy sources. We have set ourselves challenging targets for the rapid electrification of homes, no matter how humble, and must ensure that electricity remains affordable.

"Eskom has also played a leadership role through the Industrial Environmental Forum in developing appropriate environmental management practices and promoting them throughout the southern African business community."

*Ed Falkman is chairman of Waste Management International plc, a part of WMX Technologies, the world's leading environmental services organization. The company operates in twenty countries worldwide providing a range of environmental services to millions of municipal, commercial, and industrial customers. Ed chairs the Environment Commission of the International Chamber of Commerce and the WBCSD Working Group on Sustainable Production and Consumption.*

"For almost twenty years I have focused on providing services that have improved the quality of life, health, and the environment for people in countries across the globe. Having spent extensive time in Africa, the Middle East, and South America during my youth, I learned early on that throwing money at environmental problems alone is not likely to solve them. Leadership is fundamental, particularly in leveraging existing resources human or otherwise to achieve environmental improvements. The selection of cost effective technological solutions is also key to meeting the aspirations and needs of industry and communities. I see our role at WMI as helping leaders to organize their resources and select appropriate technology in order to deliver high quality, efficient, and affordable environmental services that make a real contribution to the goals of sustainable development.

"I can also give testimony to the fact that our customers are embracing the concepts of eco-efficiency in the way they do business. We see less waste being generated, more wastes being reused or recycled and greater emphasis on the conservation of energy and natural resources. This is creating new dynamics in the marketplace, which I believe will transform the way my company operates in the future. I am convinced as I look forward to the next twenty years that our destiny is to become more a resource and materials management company."





## Acknowledgments

Although for practical reasons our names appear as the authors of this book, much of the credit for its content belongs to others. Its origins lie in the World Business Council for Sustainable Development working group on eco-efficiency, which we had the good fortune to chair. The group's mission was to transform into action what was then a vision, eco-efficiency, by providing examples of how it had improved the economic and environmental performance of companies. As part of its activities, it convened two expert meetings in Europe (Antwerp 1 in November 1993 and Antwerp 2 in March 1995) and one in the United States (Washington, D.C., in November 1995). A list of all the participants at these meetings, and of working group members, is located at the end of the book.

We are especially grateful to Allen H. Aspengren, eco-efficiency manager of 3M, and Peter James, director of the Sustainable Business Centre, for their inputs to the preparation of this text, and to the anonymous reviewers of MIT Press for their comments on early drafts. Thanks are also due to the members of the WBCSD editorial steering group, consisting of Paul Adams, Frank Bosshardt, Claude Fussler, Jan-Olaf Willums, and Ben Woodhouse, and all those like Peter Hindle, Jane Hutterley, Ross Stevens, Clement Malin, and Judith Mullins who read drafts of the manuscript and submitted some of the best-practice examples reproduced in the text. We have also cited a number of company examples from various publications of the UNEP Industry and Environment Programme, which provides invaluable assistance on cleaner technology to many companies around the world, and from *Tomorrow* magazine, which has a close working relationship to the WBCSD. In addition, we would like to acknowledge the valuable contribution

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made by the WBCSD Working Group on Sustainable Production and Consumption (SP&C), chaired by Ed Falkman, chairman of Waste Management International. Some of the ideas, concepts, and case studies referenced throughout the text are drawn from their publication "Sustainable Production and Consumption: A Business Perspective" (Geneva: WBCSD, 1996). A list of the SP&C Working Group is located at the end of the book. Finally, the WBCSD Secretariat has provided direction and administrative support during the many years in which this project has been under development.

Given that this book is the product of a collective effort and draws upon many published sources, it has been difficult to check every detail within it. But we hope that we have avoided any errors of fact or unsubstantiated assertions. We also hope that we have reflected the views of the members of the WBCSD and other environmentally proactive companies although ultimately we are solely responsible for all opinions expressed in the following pages.

## Introduction

In 1992 business received a wake-up call. The Rio Earth Summit highlighted the potential risks to ecology and long-term economic and social development created by current patterns of industrialization, population growth, and social inequality. The message to companies doing nothing was the need for urgent action. The message to companies already taking the environment seriously was to do more and to pay greater attention to the issue of sustainable development.

Those issues were set out in a blueprint called Agenda 21 signed by over 150 heads of state and government. Agenda 21 stresses the need for fundamental political, social, economic, and industrial change in order to conserve natural and biological resources, limit pollution, and build strong and prosperous communities in all parts of the world.

The business inputs to Rio were summarized in two influential books. One, *Changing Course*, was a product of the Business Council for Sustainable Development.<sup>1</sup> The other, *From Ideas to Action*, was associated with the International Chamber of Commerce.<sup>2</sup> The books set out the views of progressive business leaders who recognized the challenge of sustainable development and were, as a number of case studies showed, already beginning to integrate it into their business strategies. *Changing Course* also coined a term, *eco-efficiency*, to describe activities that create economic value while continuously reducing ecological impact and the use of resources.

Since then, business and its new representative body for environmental and sustainability issues, the World Business Council for Sustainable Development (WBCSD; see appendix) has done a great deal to develop the principles and practices of eco-efficiency. It has also

responded to a changing business and social climate. Corporations today are publicly accountable. People don't just complain if they do not like what business is doing: they stop buying, sue, and lobby for new laws. Industry and its business customers operate under constant scrutiny. This is an uncomfortable development, but it is positive because it encourages corporations to think strategically about the needs of society.

As so much has happened in the half decade since Rio it is time to take stock of where eco-efficiency is now and what the companies that are implementing it have learned. The overall message from doing this is that eco-efficiency works and builds value for customers and stakeholders. The secret is moving away from a compliance-focused, crisis-avoidance mentality and seeing good environmental and social performance as the essential foundation for the market and public reputation and the motivated and confident staff that creates success in today's business environment.

Chapter 1 develops this point and shows the environmental and business logic for change. It also demonstrates that eco-efficiency has much in common with other business ideas.

Chapter 2 shows how the issues of sustainable development already impinge on the business bottom line and influence competitive advantage. Taking them seriously can create such tangible benefits as enhanced resource productivity, reduced liability risks, preferential and/or cheaper access to capital, insurance and other resources, and new product and business opportunities.

Chapter 3 spells out in detail just what eco-efficiency is and describes guidelines for practical action.

Chapter 4 shows how companies can organize for and implement eco-efficiency. Many elements are involved, but underlying all of them is the importance of people. It is their ideas and commitment that make eco-efficiency happen in the real world.

Chapter 5 addresses the critical issue of partnership with other companies, business associations, communities, regulators and environmental groups, and other nongovernmental organizations (NGOs) as an essential prerequisite for achieving eco-efficiency.

Chapter 6 provides case studies of progress toward eco-efficiency in Colombia and at ABB, Andersen, Dow, EBARA, S.C. Johnson, Kvaerner,

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Ontario Hydro, Philips, Roche, Statoil, Swiss Bank, and 3M. (Shorter case studies of other WBCSD members are found throughout the book).

The final chapter concludes that business can and will play a leadership role in achieving sustainable production and consumption. At the same time, governments and others can advance sustainable development by changing the "framework conditions" within which business operates such as regulatory and tax regimes to make them more conducive to eco-efficiency.

Of course, changing framework conditions does not mean "get the regulator off our backs" we recognize that regulation has improved environmental conditions and will always be necessary to achieve baseline standards and control free riders. But, as we show, there is evidence that command and control regulatory approaches can hamper and conversely that more flexible regulatory approaches can encourage the innovation and proactive actions we need.

What we ask of governments and other stakeholders is no more than we ask of ourselves and our fellow business leaders. Recognize that sustainable development is the big issue of our time and that all of us business included must do much more to be sustainable. Recognize too that the journey toward it and the full implementation of an eco-efficient business strategy will take decades and require a great deal of learning and adaptation. In that spirit, we offer this book as work in progress in responding to Rio's wake-up call. We know that the concept of eco-efficiency needs further refinement. The process of developing this book, for example, has made us aware that we need more and better eco-efficiency metrics. But industry has done enough to show that eco-efficiency can deliver environmental, social, *and* business benefits and is a practical route toward sustainable development. The companies we are associated with and fellow members of WBCSD are committed to continue their journey along this route. We hope that this book provides them with encouragement and arguments to go further, faster. We hope too that it will persuade those who are not yet traveling to join us, and provide a useful map to guide them. Both of these actions are necessary if we are to create a better planet through better business.

## Appendix The World Business Council for Sustainable Development

The World Business Council for Sustainable Development (WBCSD) is a global organization that has been established to encourage these initiatives and further develop policy proposals and best practices including the concept of eco-efficiency. The Council has two broad aims. One is to develop closer cooperation among business, government, and all other organizations concerned with the environment and sustainable development. The other is to encourage high standards of environmental management in business itself. Its specific objectives are:

*Business leadership* to be business's leading advocate on issues connected with the environment and sustainable development

*Policy development* to participate in policy development to create a framework that allows business to contribute effectively to sustainable development

*Best practice* to demonstrate progress in environmental and resource management in business and share leading-edge practices with members

*Global outreach* to contribute to a sustainable future for developing nations and nations in transition.

The Council builds on the work of two predecessors, which merged in January 1995. One was the Business Council for Sustainable Development (BCSD) in Geneva, set up by Swiss industrialist Stephan Schmidheiny in response to a UN request for business inputs to Rio. The other was the Paris based World Industry Council for the Environment (WICE), a post-Rio initiative of the International Chamber of Commerce (ICC) to provide business inputs to the implementation of Agenda 21.

The WBCSD now has over 120 individual members drawn from 34 countries and more than 20 major industrial sectors who are united by a shared commitment to the environment and to the principles of economic growth and sustainable development. The council also benefits from a thriving network of national and regional business councils and partner organizations in all continents. This incorporates 600 other companies, many in developing countries and those in transition from

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a former communist rule to market economies. Chapter 5 provides some examples of their work. The geographical and sectoral diversity of this grouping is a source of considerable strength to the WBCSD, and it allows the organization to speak for business with a credible voice on sustainable development matters.

The WBCSD also has two distinctive features: proactivity and CEO leadership. All members share a triple responsibility: to participate in the work program; to advocate publicly the sustainable development message; and, perhaps most important, to lead by example in the field of environmental protection. They are all committed to taking action now and in the future to make their own activities more sustainable.

This commitment is reinforced by WBCSD's CEO-based leadership. Its council comprises the chief executives of its member companies. Their support is vital in three ways. First, each WBCSD work group is led by one or more CEOs, which means that their wide business experience and personal authority can be brought to bear on the project's many, and sometimes divergent, threads. Second, as prominent members of the business community, they can act as advocates for the policy positions developed by the WBCSD. And third, they are able to enlist support from within their own organization, both for the WBCSD's work program itself and, more generally, for the adoption of sustainable environmental management practices by their companies.

This book draws heavily upon the publications and other outputs that have emerged from these processes. The box provides a summary of some of them.



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