Innovation, technology, sustainability & society

Jürgen Dormann
Aventis

Chad Holliday
DuPont

World Business Council for
Sustainable Development

Innovation, technology, sustainability & society

A World Business Council for Sustainable Development project

Jürgen Dormann
Chairman of the supervisory board
Aventis

Chad Holliday
Chairman and CEO
DuPont

Innovation,
technology,
sustainability
& society

Co-chairs' introduction

We live in a time when the speed of innovation has increased exponentially and the technological landscape is changing very rapidly. This presents a challenge to companies that conduct cutting edge research and endeavor to create new and distinctive products. It also challenges the markets for which our products are destined and which cultural value systems and political frameworks shape. For sustainable development to take place, there must be dialog between the innovators and the stakeholder groups whose cultural and political realities may not be prepared to accommodate innovation.

We therefore launched the Innovation and Technology project to determine the business actions necessary to understand and anticipate societal needs and the impacts of innovation and technology introduction. If we do this well, we will maximize shareholder and societal value with the new products and services that we are developing.

The project work divided into two core areas — assessing sustainability during the innovation process and an extended dialogue with stakeholders on intellectual property rights. Fundamentally the real value in each case was the stakeholder engagement. The processes were very different, but similar in that we worked over an extended time period with a specific group of stakeholders to create a set of recommendations. So while we will present the conclusions of the work in this report, the key learning that we want to share up front is the value of the stakeholder engagement process. The stakeholders challenged us to think much more broadly about the issues. For instance, one of the thrusts of the IPR dialogue was on use of the human genome, which initiated conversations that spanned a much broader range of topics such as the patient's right to know. If you leave with only one action item from this report, we hope that it is to find a place to engage non-traditional stakeholders into your innovation process.

We have identified four key questions that should be asked during the innovation process. We did not attempt to create a recipe for when and how to ask these questions. Each company has a unique culture and way to approach their innovation processes. We have given examples of how some companies have done parts of the process to help generate ideas on how you might want to approach the integration. In the end it is up to the individual company to figure out when and how to integrate these questions.

Innovation is critical for the on-going success of any enterprise. Institutions that don't innovate disappear. However, new innovations turn into sustainable business assets only if they are acceptable to society at large. The challenge of really integrating sustainability thinking into business processes is significant, but if not successfully met, we, as companies, will not be sustainable.

Jürgen Dormann
Chairman of the supervisory board
Aventis

Chad Holliday
Chairman and CEO
DuPont

Contents

Executive summary

Innovation is at the core of creating a sustainable human society. As a society, we will not succeed in creating a sustainable world if we focus merely on doing more efficiently what we currently do.

Innovative technologies, however, are discovered, developed, and marketed in an environment that consists not only of markets, supply chains, and distribution networks but also of a number of disturbing social and environmental trends throughout the world: threatened ecosystems and social support systems, a widening gap between the rich and the poor, lack of access to real knowledge, even in a sea of data, and growing concerns about the effects of globalization.

Can innovation and technology be part of the solution that reverses these negative trends? If so, how can businesses innovate in ways that have a positive impact on these trends and generate value for their company?

Companies that have pursued significant new technologies have found that innovation is not "business as usual". Society is taking a more active role in determining what is acceptable and what is unacceptable. People fear the unknown, especially when they believe that it could adversely affect their health or established social systems. So what must businesses do to maximize their value to both shareholders and society through their innovation processes?

The working group on Innovation, Technology, Sustainability and Society attempted to answer the following question: What must a business do to understand and anticipate societal needs as well as the effects of innovation and new technology? We explored the challenge of innovation through two separate but related processes.

One team, comprising business and external experts, examined the framework of innovation and development as generally practiced by business. It then looked for the ways to expand that framework to include sustainability.

The other team focused on intellectual property rights (IPR). IPR have become an essential element in a world in which wealth is increasingly based on access to information and knowledge. IPR is an example of an innovation-related issue that is increasingly being challenged by stakeholders, especially in rapidly evolving sectors like biotechnology. As a consequence, our systems of corporate governance and perceptions of social responsibility are likewise evolving. A network of interested parties from business, governments, and civil society therefore engaged in a dialogue to find out in what respect business, especially multinational companies, could integrate their IPR policies with the perspective of sustainable development.

In reuniting the two processes, we recognized a particular need to focus on company R&D processes as driving forces to new products and technologies. We identified four fundamental questions that should to be asked during any innovation and development process. These questions do not answer the "how to" — that can be answered only by the individual organization. The questions do, however, challenge an organization to look for places within its current process that could be modified to enhance thinking about sustainability. All of the questions can be used to challenge a number of steps in the innovation process. They do not have to be asked in a specific order. In fact, each question will probably be asked a number of times throughout a development process.

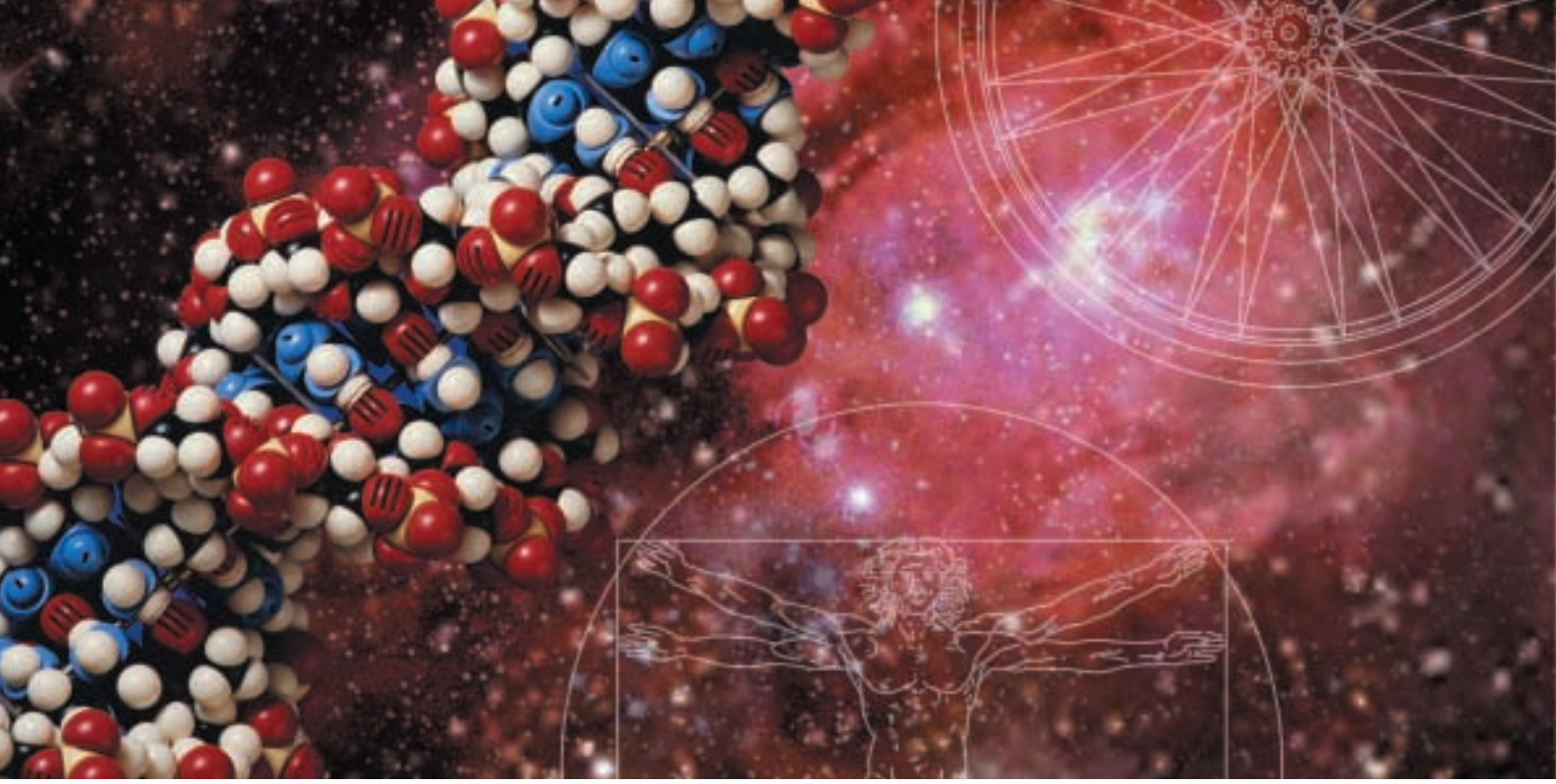
We believe that the integration of sustainability thinking into a business's innovation process — not as a negative or limiting factor in the creative process, but as an opportunity — is in its best business interests. Companies whose products and services receive quick acceptance from society and also create solutions to environmental or societal problems will benefit. In the long run, such companies will be the ones that succeed.

How can we ensure that sustainability is part of the creative process?
The generation of new ideas is the first step in any innovation process. But unless they understand the challenges and opportunities involved in creating a more sustainable world, the people generating the new ideas within a company will not necessarily think toward sustainable solutions.

How can we ensure that sustainability considerations are part of the management of the development process?
Once an idea has been created, it must be developed in such a way that the ultimate innovation meets the intent of creating a more sustainable service or function. Most companies have some sort of process to determine which developments will continue to be funded, but does the process include an evaluation of the effectiveness with which the company deals with the environmental and societal impacts of the developments?

When and how can external viewpoints enrich the creative and development processes?
We all have worldviews defined by our own experiences. Including at all stages of development nontraditional interests with different worldviews and perceptions of both the needs for and the value of alternative solutions can enhance the entire development process.

What processes are most likely to leverage the value of our intellectual capital?
Most companies view their intellectual property as an asset — a way to derive current value from the business as well as a platform for future developments. How to protect intellectual property is a significant business question. The rules of the game are changing, however, and a key question is how to balance private rights and public goods in this context.



The opportunity

Humans have been innovators, from the first shapers of stone and wood into crude implements, to the inventors of electronic gadgets that entertain us and help us manage our lives from our shirt pockets.

Today innovation is based not only on the challenges, problems, and needs but also on the social, political, and cultural conditions prevailing in the prospective market. People fear the unknown — especially when they believe that it could adversely affect their health or established social systems.

Life expectancies have increased, the availability of natural resources has more than kept pace with demands, and food supplies have defied Malthusian logic. Nevertheless, the by-products of modern civilization cause legitimate concerns like increased carbon dioxide levels in the atmosphere, threatened ecosystems, and persistent bio-accumulating toxins. Although innovation and creativity are still highly valued, many wonder whether new technologies will bring greater downside risks than upside benefits.

Our challenges in business are to create the major innovations necessary to enable a sustainable human existence and to ensure their acceptance by society. No easy task. In the 2002 report *Tomorrow's Markets,* signals from current trends are leading to an unsustainable human society.

From a merely parochial point of view, that would mean a poor business climate. Even more importantly, these trends represent a source of continuing competitive advantage to those companies that understand them and respond to them through their new products, technologies and services.

Business can increase its contribution to sustainable development through attention to several key areas. These were outlined in depth in the WBCSD publications *The Business Case for Sustainable Development* and *Walking the Talk*. If business's contributions in these areas align with the attitudes and expectations of society, the resulting system outputs are more likely to be sustainable.

A number of WBCSD projects have examined aspects of potential business leadership either directly or indirectly. The intent of this project was to focus specifically on innovation and businesses' role in today's society. How should business respond to changing rules and expectations? What processes and tools could help business meet the challenge of remaining viable in and contributing to the sustainability of human society?

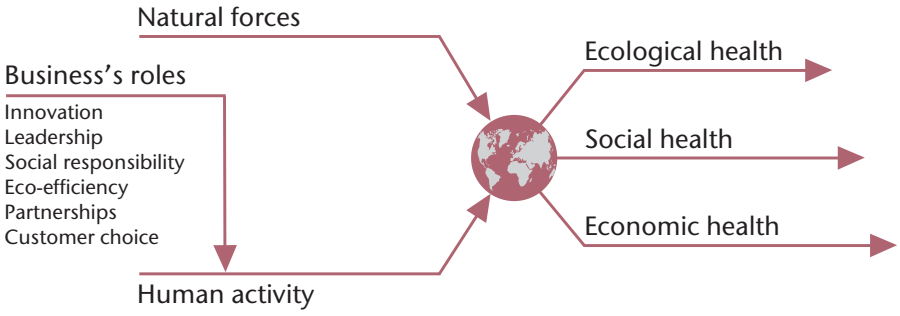
An open QUESTION

How does the market value the health of the environment or the health of the citizenry? While it may be likely that the customer would avoid a major environmental despoiler, or a prominent sweatshop operator, what about those smaller acts with negative effects to people and the natural world? In total they may be even more unsustainable.

How can the market properly reward or discourage smaller acts, either positive or negative, thus leading the way to sustainability?

Can our innovative capacity also work to change the market framework to value these sustainable, or unsustainable, acts?

THE CONTRIBUTION of business



A macro view of the **innovation process**

The pursuit of knowledge is intrinsic to humankind. Since the beginning of societies, people have pursued knowledge and then striven to use the new knowledge to improve their quality of life. This process has accelerated as scientists open ever more windows to the mechanics of our world. New knowledge continues to come. How it will be developed and implemented is critical to creating a sustainable society.

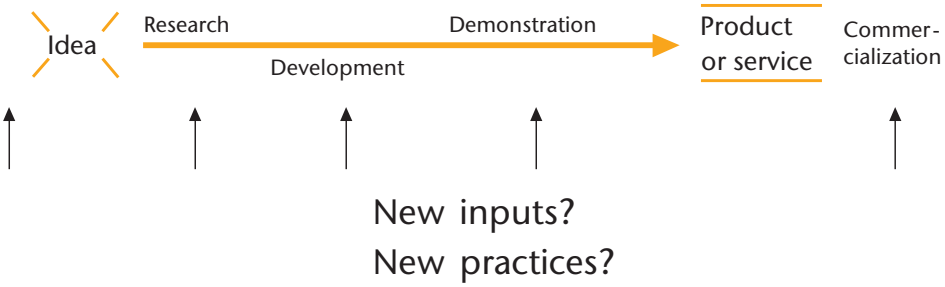
In fact, the role of businesses is to translate ideas into products and services and then deliver them in the most efficient ways to the marketplace. Ultimately the market determines both the value of a product or service and the company's effectiveness in delivering it. As the market more and more recognizes ecological and social factors, along with price, quality and function, the challenge to business success becomes more complex.

Our challenge in this report is to examine the development process and to identify those new inputs and practices that will help create more sustainable products and services. What few points in the process represent high points of leverage for the introduction or reinforcement of sustainability principles? Successful businesses will test society's needs, values, and concerns at key stages during development, thereby reducing business risk and increasing business opportunity.

This may sound easy, but many things can and do get in the way. Whether it is fear of the unknown or the risk of compromising competitive interests, it is not hard to find rationale for setting aside sustainability concerns. After all, we are all challenged to do more with fewer resources and to deliver new products and services faster and cheaper.

While it is important to recognize that these concerns are part of the reality of today's business practices, it is just as important to accept that sustainability issues are also part of what defines business success today.

THE ITSS challenge



Innovation, research and development

As important as the initial idea is, it is not sufficient and is not truly an innovation until it has undergone further development. As knowledge flows toward commercialization, the idea gains substance, and intellectual capital is created. The process generally goes through four phases:

① Research, in which basic concepts are tested
② Development, in which the elements of practicality and economy are alloyed with the fundamental concepts
③ Demonstration, in which the best idea or ideas are tested in pilot form or at full scale
④ Commercialization, through manufacture, sales, licensing, or other steps

Development is seldom a linear process, and it can be accomplished either totally in-house or through partnerships, research contracts, networks, and the use of consultants at any or all stages.

Companies are becoming "borderless" — they are relying more and more on outside providers of knowledge and tools. Companies buy innovations and know-how by setting up webs of partnerships and alliances with research institutes and other companies. They are no longer working in linear structures but as networked organizations. The challenge is to "orchestrate" the learnings from such virtual discovery organizations into commercial value.

In addition, learnings from one phase of the process are frequently recycled back into the earlier phases, and problems that show up later must often "go back to the lab" for further work. Ultimately a product or service emerges in pilot form or at the demonstration phase that can be successfully commercialized, but the process is often messy, non-linear, and fraught with dead-ends. More than one "innovation" may be required to enable the product or service to reach commercialization.

An innovation may be applicable to an existing supply chain, or a new supply chain may even be created. A value chain, in addition, includes indirect influencers and must take into account the fundamental driving forces that form the basis for the product or service. Influencers can be formal (regulators, certification bodies, trade groups) or informal (public interests, activists, neighboring communities). Understanding the driving forces themselves can enable a company to contemplate offering different products or services.

Innovation can focus on any element of the supply chain. In fact, an innovation that strengthens the supply chain and creates value for both the customer and the business can intersect the supply chain anywhere. The impact of innovation is thus not limited to one's own operations, as customers, suppliers, and even business partners (e.g., licensees) can benefit from innovation within the supply chain.

More importantly for our consideration, the innovation/development process can be enriched by learnings from any element of the supply chain and from interested parties external to the supply chain. For example, the classic purpose of market research is to identify unfulfilled customer needs, especially where core competencies can be used to fill those needs.

Expanding the scope of the value chain to include non-traditional stakeholders will help businesses identify and respond to a fuller range of market signals.

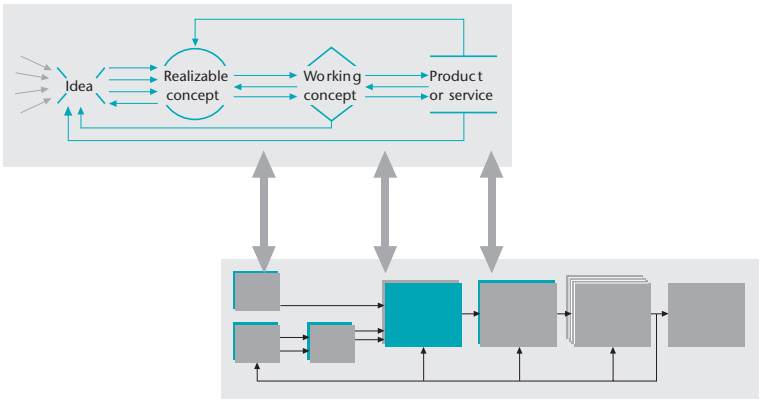
Supply chains as BIOLOGICAL SYSTEMS?

In the natural world there is no waste. Detritus from one organism is food for another. In this way nature continues to cycle and recycle organically. Its only input is solar energy.

Supply chains that take resources at the beginning and reject waste along the way and at the end are in this sense unsustainable.

Part of business's innovative power must be directed to the creation of value cycles which more nearly mimic the way nature works.

INNOVATION INFLUENCED
by interests both internal and external to the supply chain



Four key aspects of **sustainability in innovation**

Four fundamental questions should be asked during the innovation process to ensure inclusive attention to influencers of success:

① How can we ensure that sustainability is part of the creative process?
② How can we ensure that sustainability considerations are part of the management of the development process?
③ When and how can external viewpoints enrich the creative and development processes?
④ What processes are most likely to leverage the value of our intellectual capital?

All of the questions can be used to challenge a number of steps in the innovation process; they do not have to be asked in a specific order. They all need to be considered. When and how they are asked depends on the specific interests and needs of the business.

How can we ensure that SUSTAINABILITY IS PART OF THE CREATIVE PROCESS?

Creativity is the great enabler of innovation. The development pipeline is not of much value unless good ideas are fed into it through the creative process. Theoretically, innovation results from the intersection of creativity, competence, worldview, and leadership. Although we could probably write an entire report on how each of these aspects could be enhanced by the integration of sustainability thinking, we have chosen to focus on business leadership and the worldview of the innovator as the ways that we could most substantially influence creativity. One thing we should remember, however, is that no matter how much planning and management may take place, good ideas are often also the result of just plain good luck!

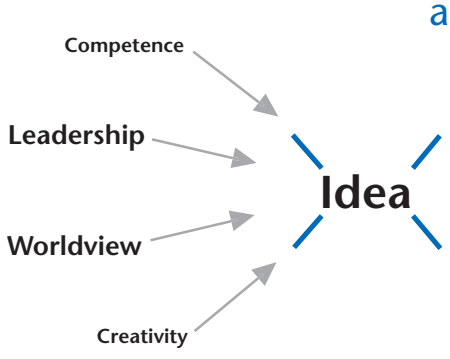
Vision and leadership are critical to setting the stage for creating a more sustainable business. They are much more than statements in the annual report or plaques on the wall — they are about what people strive for the organization to be. Ultimately, vision and leadership will determine what opportunities the business considers and how it decides to pursue them. Leaders who inspire their organization with a vision that incorporates sustainability play a key role in ensuring that sustainability is part of the organization's creative process.

Worldview consists, among other things, of character, beliefs, technical background, perception of needs, value chain awareness, social interactions, and personal motivations. In simple terms, how a person perceives a situation or problem determines how he or she responds to it.

Sustainability and the CREATIVE PROCESS

- **Provide alternative views of the world**
  - Experts
  - Campaigners
  - Idealists
  - Pragmatists
- **Encourage alternative worldviews through creativity enhancement processes**
  - Brainstorming, idea generation
  - Exposing people to other settings, realities
- **Ensure that the linkages exist between development and the value chain**
- **Look for new platforms as well as upgrades to existing business**
- **Consider sponsoring small businesses or entrepreneurs in developing countries**
- **"Trade" experts with another organization**
- **Engage students or representatives from other generations**
- **Challenge your business models with alternative scenarios of the future**

CREATIVITY, INNOVATION and luck



Are researchers and developers aware of the relationship of sustainability issues with the basic driving forces of market need? Have they integrated a broad group of market values? At the idea creation stage, are the "constraints" imposed on innovation only those that are minimum and essential? Is sustainability "on the radar screen" of the market research organization? Are there new business incubators to support ideas with a broader worldview? Do employees have the opportunity to pursue discretionary ideas on company time?

A number of initiatives are already under way that help link those who understand the needs of the underserved communities with those who have the ability and interest to help address the problems.

Worldview is not just a matter of technical training. It is also built from an understanding of issues, and even the fundamental aspects of the innovator's persona, as well as more technical knowledge, such as how the market works, what the real needs are, and how people interact. If the people who are responsible for the creative sparks in the business are not aware of the demands and limits imposed by the issues of sustainability, then their worldview, and hence their creativity, will be limited.

How can we ensure that sustainability and a broad worldview are part of the creative process without over-managing it and the creative genius we are trying to encourage? Creativity can be nurtured and enhanced by a few simple techniques.

ThinkCycle

ThinkCycle is a nonprofit initiative, started at the Massachusetts Institute of Technology (MIT), engaged in identifying and addressing design challenges related to underserved communities and the environment. ThinkCycle seeks to create a culture of open innovation in sustainable design, with a collaborative network of individuals, communities and organizations around the world.

ThinkCycle supports the research and development necessary to carry ideas from prototyping, through manufacturing, and on to the end user. In all cases, ThinkCycle works to connect communities, non-governmental organizations, academia, industry and government in the process of open collaborative design.

ThinkCycle offers companies a way to identify the needs of emerging markets in developing countries, and to develop an entrepreneurial and resourceful pool of future employees. Industry can collaborate with ThinkCycle to implement, market, and distribute technologies developed in the program.

http://www.thinkcycle.org

Honeybee

A Newsletter of Creativity and Innovation at the Grassroots is a voice for creative farmers, artisans, pastoralists and other grassroots innovators. Honeybee Network is an experiment in people to people learning. It began twelve years ago with the focus on interconnectivity among knowledge rich-economically poor farmers across language barriers and to provide visibility to local inventors. In 1997 the network established GIAN — Gujarat Grassroots Augmentation Network — to help in filing patents on behalf of inventors, to develop linkages with science, technology, and design institutions and to help convert innovations into enterprise through mobilization of investments. The Honeybee Network offers the opportunity for companies to work with innovators to create solutions to real problems while assuring that the innovator receives value from their knowledge.

http://www.sristi.org/honeybee.html

Base of the Pyramid (BOP) Consortium

is a group sponsored by the University of North Carolina's Kenan-Flagler Business School. The objective is to facilitate business model innovation at the Base of the Pyramid by developing systematic frameworks for identifying, evaluating and quantifying the critical parameters necessary to create opportunities. By leveraging the experience and resource base of a diverse group of organizations, the Base of the Pyramid Co-laboratory offers a rapid, low-risk means to fill the information gap for business development at the BOP. The consortium creates the opportunity for the sharing of key learnings to all consortium members. It also facilitates the testing of "system-interventions", a proposed business model that recognizes and addresses the interdependencies among BOP consumer needs by providing a basket of offerings (e.g., clean water, communications, transportation, electrification).

http://www.kenan-flagler.unc.edu/CSE/BOP.htm

Exposure to outside views through interactions with experts and activists can help generate new opportunities for innovation. Also, we can implement processes that encourage creative thinking, like brainstorming sessions and idea generation that involve people who have different worldviews. After the idea generation phase, the creative process must include a means of evaluating the ideas in terms of the current business reality, so that opportunities and points of leverage can be determined.

Some would say that we don't see what we haven't thought about. Introducing sustainability thinking into the creative process is primarily the task of assisting those so engaged to understand current world challenges from different perspectives. If they see the challenges, maybe they will be able to see the opportunities and possible solutions.

Corporate STATEMENTS

Interface "Our goal is to be the first company that, by its deeds, shows the entire industrial world what sustainability is in all its dimensions: people, process, product, place and profits — by 2020 — and in doing so we will become restorative through the power of influence."

http://www.interfaceinc.com/goals/vision.html

BP "We need to reinvent the energy business; to go beyond petroleum. Not by abandoning oil and gas — but by improving the ways in which it is used and produced so that our business is aligned with the long term needs of the world."

http://www.bp.com/centres/press/stanford/highlights/index.asp

Johnson & Johnson "For more than 50 years, Our Credo has helped us in fulfilling our responsibilities to customers, employees, communities and stockholders. Our worldwide family of companies shares this value system in 36 languages spreading across Africa, Asia/Pacific, Eastern Europe, Europe, Latin America, Middle East and North America."

http://www.jnj.com/home.html

DuPont "DuPont is on a mission to achieve sustainable growth, which is defined as increasing shareholder and societal value while decreasing the company's environmental footprint. The company has a three-part strategy: deliver new products through the power of integrated science, vigorously pursue knowledge intensity in all businesses, and significantly increase productivity by using Six Sigma methodology."

http://www.dupont.com/corp/overview/glance/sus_growth.html

Shell "Do you still think of Shell as an oil company? In fact, we're a global energy company. The aim of the Royal Dutch/Shell Group is to meet the energy needs of society, in ways that are economically, socially and environmentally viable, now and in the future."

http://www2.shell.com/home/Framework

CH2M HILL "Make the most of your world... CH2M HILL people help our clients imagine, design and build a better world. We create and operate facilities, infrastructure and systems that bring clean water, safe transportation, efficient industry and life-enhancing technologies and products to people everywhere."

http://www.ch2m.com/flash/movie.htm

How can we ensure that sustainability considerations are part of the management of

THE DEVELOPMENT PROCESS?

The development process is a series of challenges and decisions leading ultimately to the conversion of an idea into financial value. How much investment is needed? What will the market demand be? What will the cost of providing the product or service be? How do we protect competitive advantage? Decisions made early in the development process can be critical to meeting both corporate and societal expectations and, thereby, financial targets. Many companies have formal processes to evaluate the potential and focus of research before additional research money or capital investments are committed to it. These staged management processes could easily incorporate additional criteria or external inputs for evaluation of sustainability issues. There should always be at least an informal assessment process at key steps throughout the development, even for small projects.

Two issues must be dealt with in the management of the development process so as to incorporate sustainability issues. The first is determining when a formal assessment process should be considered. The next issue is determining how existing processes for management of development can be leveraged to include sustainability.

The following steps describe the overall approach:

① Challenge the idea with sustainability at the initial stage of development and evaluation.

② Be certain that sustainability issues have been addressed by the final stage of development.

③ Determine the appropriate level of examination at intermediate stages of the development process.

④ Make sure that the development process includes exposure to outside views.

The difficult determination is how much evaluation for sustainability issues is needed during the intermediate stages. There is no general answer to this question, because not only the effects of each development but also the culture and receptivity of each organization are different.

A series of questions and issues should be integrated into any research and development effort. It is critical to remember that not only the environmental issues but also the social and broader economic impacts of the development must be considered.

You don't need to start from scratch. Companies around the world have already developed processes that represent initial approaches to

Things to CONSIDER

Reputation issues
- Name/brand recognition
- Stakeholder favorability
- Ethical conduct

Societal concerns
- Human rights practices
- Access (to knowledge, IT, natural resources, essential medicines, ...)
- Labor standards
- Supply chain

Operations/Suppliers
- Waste and emissions
- Legal requirements
- Resource consumption
- Health and safety

Characteristics of materials
- Hazards/Risks
- Persistence
- Bioaccumulation
- End of useful life issues

External codes and guidance
- Global Compact
- Sullivan Principles
- The Natural Step
- ILO Employment Standards
- The CERES Principles

integrating environmental and societal factors into the development process. Some interesting practices that apply at various points in the development process or value chain are illustrated throughout this report.

In addition, a number of other "standard" business processes could be modified to incorporate stakeholder inputs or sustainability issues. Consider how the following processes might be adapted for this purpose:

- Staged gate research and development management
- Capital authorization procedures
- Business strategy reviews
- Market research
- Design for Six Sigma
- Societal concern screening
- Opinion research
- External directors, board committees
- New business incubator processes, such as "Game Changers" recognition processes, seed money programs, and sustainable new business processes

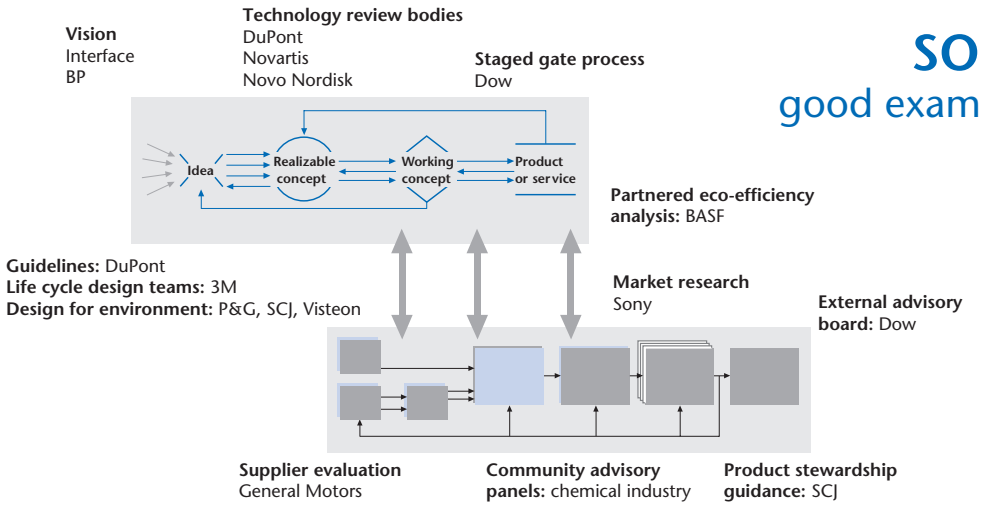
Staged Gate research MANAGEMENT

Many companies have adopted a process known as "staged gate research management" to improve the productivity and focus of their research and development activities.

This approach divides the development activities into several discrete phases and makes funding for each development phase conditional upon successful completion of specific objectives during the preceding phase. The project must pass through "gates" that involve review of the specific objectives and the project's continuing relevance to the business's purpose.

Such a process is well suited to incorporation of stakeholder inputs and challenges from sustainability concerns, both in the objective-setting process and in the subsequent reviews.

SOME good examples



SC Johnson's

Product Stewardship Process: GREENLIST

In keeping with its vision of sustainable development, SC Johnson has engaged in developing new screening criteria for all of its products' raw materials. This review process is called Greenlist, a tool used to help the business make the best raw material choices for its products. Greenlist supplements rather than replaces existing review processes, and it focuses on the environmental impact of raw materials used in the company's products. Raw material components are classified and evaluated according to category-specific criteria.

The screening criteria used in Greenlist were developed and piloted in partnership with SC Johnson suppliers. The formulators and toxicologists at SC Johnson worked alongside their counterparts on the supply side to establish relevant, global criteria for the screening and rating of surfactants used in Johnson formulas. The process and criteria were than reviewed by government and non-governmental organization partners for relevance and completeness.

The successful surfactant model was then expanded to other raw material categories. In each category, materials are rated on the basis of four to six criteria. Ratings range from Acceptable to Best, with certain materials being classified as Restricted Use Material (RUM). The process currently covers materials making up 80% of all raw material purchase volume. New categories will be reviewed and added over time.

SC Johnson is also working with the U.S. Environmental Protection Agency (EPA) on a related pilot program called "PBT-Free". The EPA has developed a program to evaluate environmental persistence (P), bio-concentration potential (B), and aquatic toxicity (T) of raw materials. Those that are found to be PBTs will be reviewed further and, if warranted, will be eliminated from use in the development of new formulas.

Through its product stewardship reviews, SC Johnson is indeed carrying out its commitment to "creating shareholder and societal value while decreasing [their] footprint along the value chain".

3M's LIFE CYCLE Management Teams

3M's sustainable development goals revolve around improving environmental performance of their products and processes while better meeting customer needs. To ensure product responsibility, 3M takes a life cycle approach to sustainability. Through a Life Cycle Matrix and Life Cycle Management (LCM) teams, 3M ensures that its business units take a holistic approach to addressing environment, health, safety, and energy (EHS&E) issues pertaining to its products.

LCM teams are typically formed to guide the development of research ideas from the very early stages. The team includes not only research and business interests but also EHS&E representation, thereby ensuring early attention to issues that can be more difficult to resolve later in development. Through this methodology, 3M identifies both risks and opportunities for improvement at all stages in the innovation process.

This approach can also identify smaller improvements that lead to more sustainable products during the course of development, again facilitating their incorporation in the final product. For example, customers using 3M's Surface Saver tape for making ophthalmic lenses requested recyclable release liners for the tape. 3M put together an LCM team to solve the problem. The outcome was a liner-less tape dispensed from double-sized rolls, resulting in a 40% solid waste reduction for customers, reduced shipping costs for the double-sized rolls, and a virtual elimination of solvent use in the production of the tape.

By taking a holistic approach to problem-solving, 3M is able to find more effective solutions and create better products. Rather than solving one problem at a time, the LCM teams are able to simultaneously deal with production issues, make better materials choices; more effectively meet customer needs, and reduce the post-use waste created by their products.

Partnered ECO-EFFICIENCY ANALYSIS at BASF

Two key questions for industry are "How can economy and ecology be reconciled in corporate decision-making?" and "What will the products of tomorrow look like?" To answer these questions, BASF has developed a tool to analyze eco-efficiency in its products and business processes. The eco-efficiency analysis studies the life cycle of a product from "cradle to grave", beginning with extraction of raw materials and finishing with post-use. Besides environmental effects of raw materials and production, the analysis includes customer usage behavior as well as recycling and disposal possibilities. Unlike most other analyses, however, BASF's eco-efficiency analysis also includes economic factors.

The analysis is carried out on two dimensions, environmental and economic. On the environment axis, the product's "ecological fingerprint" is measured according to criteria in five categories: consumption of raw materials, consumption of energy, emissions into air, water, and soil, toxic potential of substances, and potential for misuse or hazard. Each of these categories is subdivided into specific criteria, each of which is weighted on the basis of relevance factors. On the economy axis, the product is compared with alternative products in terms of overall costs, including material and energy flows. These two values are then plotted on a graph, and the product's eco-efficiency is determined by its location relative to a diagonal axis on the graph. This method of measuring eco-efficiency allows BASF to easily pinpoint exactly which aspects of a product or process are in need of improvement.

To date, over 130 eco-efficiency analyses have been carried out, about half in collaboration with BASF customers. One such study, commissioned by the parliamentary faction of the German Green Party, compared the eco-efficiency of new and old refrigerators. Using data from Germany, BASF factored together energy costs and consumption, purchasing costs, and other environmental and economic factors to develop guidelines on when to replace a standard 140-liter refrigerator. The results were as follows: a refrigerator using less than 260 kWh per year should not be replaced, as the environmental benefits of replacing it are insignificant compared with the cost of replacement; if the refrigerator uses more than 330 kWh per year, however, it should be replaced with a new refrigerator with a class A energy-efficiency rating to reduce pollution and energy costs.

When and how can external viewpoints enrich
THE CREATIVE AND DEVELOPMENT PROCESSES?

The market risk associated with the introduction of new technology can be reduced by the inclusion of external views at an earlier point in the development process. Rarely would a business introduce a new product or service without the benefit of market testing of some kind; too much invested capital would be at risk. Typically, however, the earlier in development external views are considered, the more likely they are to be expert or technical views, and the less likely to test societal impacts and concerns. A worksheet is provided in the appendix to help with this consideration. Early inclusion of critical and non-expert viewpoints in the development process can enable more successful innovations and avoid last-minute market failures. Such failures result not only from outright rejection of the product or service but also from legal and public relations costs, delays in introduction, and the costs of retrofitting to achieve societal acceptance of the product or service.

When a company seeks the views of people outside its organization, certain problems may arise. But companies have always tested and discussed proprietary issues with consultants, experts, regulators, civic leaders, and others during the course of development. The challenge has been to identify responsible parties and develop the appropriate basis for discussion to protect one's interests. The challenge is the same with societal representatives and some of the same approaches apply just as well:

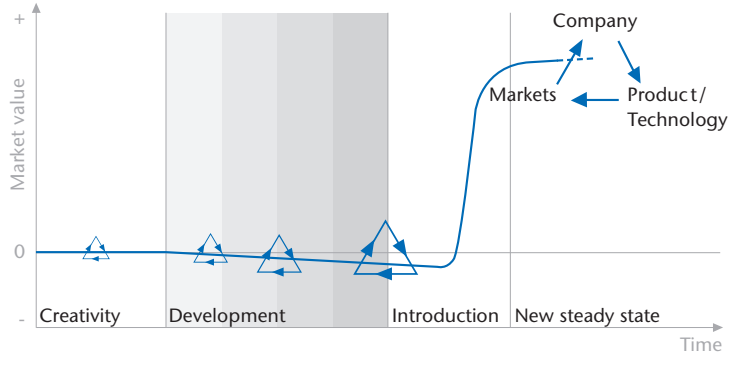
Novartis

ETHICS COMMITTEE FOR STEM CELL RESEARCH

With stem cell research as one of the big controversial sciences of the new millennium, pharmaceutical companies are constantly in the public eye, and their practices are scrutinized by governments, NGOs, and private citizens alike. To ensure that their stem cell research policy stands up to this scrutiny, Novartis established in April 2002 an Ethics Committee for research on human stem cells. Chaired by Professor Hans-Peter Schreiber, ethics professor at the Swiss Federal Institute of Technology (ETH), Zurich, this six-member interdisciplinary committee will monitor global compliance with Novartis' internal ethical guidelines.

These guidelines restrict research to stem cells that are obtained from surplus embryos created by in vitro fertilization procedures or from aborted fetuses. It is essential that fertilization take place for reproductive purposes, and parents must consent to the use of the cells with no financial benefit for themselves. Lastly, it must be clear that the embryos are no longer intended to be implanted into the mother. These guidelines would then preclude the creation of embryos specifically for research, as well as therapeutic cloning, which carries great risks and raises serious ethical concerns worldwide.

MARKET RISK CAN BE REDUCED
by earlier introduction of external views



- Securing confidentiality agreements
- Engagement of such viewpoints on general technologies rather than for specific products
- A focus on attributes and effects rather than specific products

Just as important, if not more so, is how to secure engagement of people who can benefit business. It is critical to develop a trustworthy relationship, which means that the individuals in the organization communicate openly and are willing to act on the advice or at least explain why the decision was made not to act. It may be important to go beyond the specific project and to endorse or support specific stakeholder issues as a way of building credibility and trust with skeptical, but important external parties.

Various approaches are available to engage stakeholders. Sometimes an ad hoc approach is "high return/low cost". Examples are:

- "Cold calls" exploring particular issues with individual stakeholders
- Specific projects
- Specific businesses

Since this may not always work, many organizations have more systematic approaches to stakeholder engagement, such as:

- Support of specific stakeholder organizations, either in general or on specific projects, to build a relationship and greater access (creating the possibility for the call to be returned)
- General advisory bodies, like Dow's Corporate Environmental Advisory Committee
- Community Advisory Panels at operating facilities, as at many plants throughout the chemical industry
- Technical advisory bodies, like Novartis's Bioethics Review Board on Stem Cell Research and Dupont's Biotech Advisory Council
- Even the Board of Director's oversight role is like an external review body for the organization, especially when outside directors are part of the process

As with the other questions, there is no one right answer. Every organization must determine what will work for it and what its specific business needs are. Other suggestions for obtaining stakeholder engagement can be obtained through the WBCSD.

Stakeholder engagement as a key element of the ITSS working group

To demonstrate that we were "walking our talk", the WBCSD's ITSS working group included a set of stakeholders as full members of the team from the start. At the first meeting, we scoped out what the group perceived as the key issues facing business relative to innovation and sustainability; then, over the course of the next two years, we explored those issues to create a set of recommendations. The process wasn't smooth. We stumbled a number of times. Fortunately we were able to learn from our mistakes and to develop a level of trust that made this truly a team effort. Here is a summary of what we learned.

Overall

- Take the time "up front" to explore all the assumptions and perceptions about each organization, so that everybody is working with the same information.
- Spend time early on defining roles and responsibilities, so they are clear to everybody. That doesn't mean that the roles can't change as the process evolves, but everybody needs to understand what they should do and what to expect from others.
- Trust is critical to the process but can be easily broken. The importance of timely, honest communication cannot be overstated. Make sure that clear lines of

Identifying the KEY ISSUES
An example

When Aventis decided to focus on pharmaceuticals, the new company recognized that the strategic change might well encompass critical environmental and social issues that could fall through the cracks of the new organization.

Aventis hired an expert facilitator, who was well-trusted by both activist groups and the business, to interview public interest parties regarding the critical public issues facing this focused business. Working through a third party helped ensure credibility and objectivity. The responses were collected, common themes identified, and the findings shared both with stakeholders and the business leadership.

The top issues included access to healthcare for a growing and aging population, pricing and marketing of pharmaceuticals, intellectual property rights and patent policies, the genetic and digital revolutions, access to genetic information, animal welfare, and the ethics of biotechnology research.

Through this process, Aventis recognized the emergence not only of new issues but also of new stakeholders, who had an opportunity to exert influence at a time when the new company was still forming its opinions and positions on key issues.

Follow-up activities to understand and integrate the identified issues in the new company are now well under way; they include the recently published Aventis Sustainable Healthcare Policy.

communication are always open and that there is time to air concerns, issues, new opportunities, etc. There also must be means of communications in the intervals between meetings, to keep everybody connected to the process and the work.

Business participants

- Stakeholders are willing to help, but they need to feel that they are making a difference. In fact, the stakeholders in our process were willing to commit a lot more time and energy to the process than we took advantage of.
- We had a better product in the end because a committed group of stakeholders were with us through the whole experience. We could not have received the same value from a one-time meeting.
- We could have pushed ourselves to engage an even more diverse group of stakeholders. We also could have challenged ourselves to get out of the conference room and create experiences that would have enhanced our learning.

Stakeholder participants

- Continuous improvement opportunities were easy to identify and bring into the discussion. However, it was hard to introduce step change opportunities into the discussion and to have them accepted by the business participants.
- Learning goes both ways: the opportunity was a learning laboratory that allowed us to learn more about how business thinks and approaches challenges. We also gained experience in the dialogue process.
- More diversity of viewpoints and perspectives would have enhanced the process.
- Business did not take advantage of the opportunities that they had to explore new alternative approaches.

Dow Chemical's CORPORATE ENVIRONMENTAL Advisory Council

Dow's Corporate Environmental Advisory Council (CEAC), which celebrated its tenth anniversary in November 2001, was created to provide the company with external expertise on environment, health, and safety (EH&S) issues, and their mandate was expanded in 1999 to include sustainability concerns. "The CEAC," says Dow President and CEO Mike Parker, "started as our admission that we are not omniscient-and became our reminder that we can't afford to think we are". The group, chaired by Larry Washington, corporate vice president of EH&S, Human Resources, and Public Affairs, consists of twelve experts from various organizations, including the Pew Environmental Health Commission, the World Resources Institute, and the International Institute for Environment and Development.

The CEAC has been instrumental in helping Dow to develop business strategies that are aligned with its sustainable development principles. One of its first and most significant achievements was the development of Dow's public EH&S goals for 2005. These goals, released in 1995, are referred to internally as the "three No's": no accidents, no injuries, and no harm to the environment. Dow and the CEAC developed specific targets to help the company meet these goals, including a 90% reduction in employee and contractor illness and injury, and a 50% reduction in global water and air emissions. Dow estimates a 35-40% financial return on its total investment over the 10-year period. By 2001, Dow had already achieved its goal of 75% reduction in persistent toxic bio-accumulatives and ozone depletors. The CEAC also played an important role in the development of Dow's new Sustainable Development Guiding Principles and its Sustainable Development Operating Plan.

By including external viewpoints in its decision-making process, Dow ensures that stakeholder concerns and sustainability issues are an integral part of the way the company does business. Frequent consultation with this group also ensures that Dow is kept up-to-date on the latest trends in public opinion and perception, helping the company to make the most informed decisions possible.

What processes are most likely to
LEVERAGE THE VALUE OF OUR INTELLECTUAL CAPITAL?

In a number of areas today, technology is emerging more rapidly than societal systems can comprehend and encompass it. The delay between a new technology and the development of social and ethical decisions about its use or application can increase market risk for the developers of the technology.

This problem can be readily seen in the area of biotechnology but may also be anticipated in other health-related fields as well as nanotechnology, communications and electronics, entertainment, and software. Current developments in stem-cell research represent one area in which the rules are quickly being made by governments in an attempt to keep up with the science. In such cases, with an absence of definitive rules to guide them, companies need help in steering the course of innovation. Because of the rate of innovation, what is possible may not end up being acceptable to society. The technologies being developed today have the potential to affect human society in ways far surpassing our imagination. Companies working in these areas of research and development should find ways to explore societal reactions to these technologies even before they reach the market. For example, can a company gain value from a patent on human genetic sequencing if society does not allow its application in proprietary products?

Fairly early in the development process, after some likelihood of success is indicated, decisions are made about protecting the knowledge that is being created. Most companies view their intellectual property as an asset — a way to derive current value from the business as well as a platform for future developments. How to protect intellectual property is a significant business question. Products of the innovation process have traditionally been protected through one of three basic schemes: (1) patents and copyrights, (2) secrecy, and (3) publication in the public domain.

Companies dealing with protection of emerging technologies, however, are finding patents either not necessary or, in some cases, a very fragile deal with society. New models for capitalizing on intellectual capital are being developed, the objective being to create both societal value and business value. One example is the open architecture of computer operating systems in the software industry.

Businesses within the pharmaceutical industry are looking to different models for addressing human needs in developed as well as developing countries. They are discovering that patents while properly granted under strict interpretation of patent criteria, may still be a grant not acceptable to society. Exclusive license in products with extremely high societal value may be viewed as monopolistic or contrary to public interests. This doesn't necessarily mean that a proprietary interest cannot be created or protected, but it does mean that the benefit-sharing deal with society may need to be recast.

Furthermore, the definition of "novelty" may also need to be reconsidered. Even though the product of inventive discovery, not obvious to others skilled in the art, and of great use, the exact structure of a human gene sequence

The PATENT SYSTEM

The patent is one side of a deal that the inventor makes with society. The quid pro quo is that in return for exclusive rights to the invention for a specific time, the inventor makes a prompt disclosure of the invention. Through this disclosure, society is given the basis for further improvement and further societal benefit, hence "squaring" the deal. Furthermore, the invention must pass three review criteria to be patentable: Is it novel? Is it non-obvious to one skilled in the art? And is it useful? There is also a requirement that it not be contrary to public order, morality, or legality.

Caution! CULTURE CLASH Ahead

Intellectual property protection has been utilized through patents for many years as a way to foster innovation and to provide the basis for new business formation. And even before patent systems became established inventors and creative people developed means of protecting their inventions.

At the same time, some societies have developed in which inventions are regarded as community assets rather than individual accomplishments. When these two cultural viewpoints meet, conflict is quite possible, and special approaches must be found to meet both practical and cultural expectations.

seems to be better left to the public domain, even if means of manipulating it to control disease are clearly patentable.

Through our dialogue process on emerging technologies, we identified areas in research and implementation that would clearly pose ethical concerns for stakeholders. Such exploration of the limits will help WBCSD members avoid possible stumbles on the way to the marketplace and thus direct their research and legal resources to the most promising options. The benefits of engaging in a stakeholder dialogue on such issues even before a company has all the technical or development answers are:

- Identification of areas in which patents may not be applicable to protect intellectual property
- Recognition of situations in which society's benefit from an innovation may outweigh the rights of the inventor
- Development of meaningful relationships with previous adversaries
- Identification of possible technology development areas for which the risk of societal non-acceptance is significantly higher

When considering protection of intellectual property rights, a company should determine which means of protection would generate the most business and societal value. If patenting is determined to be the best alternative, the company should examine different models for sharing the benefits with specific groups to ensure a more balanced distribution of value.

Stakeholder dialogue on **intellectual property rights (IPR)**

The process

The WBCSD project involved a network of about 50 participants, from the business and non-business world (NGOs, researchers, governments) from Africa, Europe, North America, South America, and Asia as well as experts in the field of IPR, including a number of international bodies. (See appendix for listing.) A consensus report is being drafted by the Steering Committee under rules agreed to by all participants and is expected in 2002. A summary report will be posted on the WBCSD website as part of the Innovation and Technology project. A summary of the dialogue issues is also presented in the appendices to this report.

The dialogue process involved participants' continued and sustained interaction over a period of one year. It started with a kick-off meeting in May 2001, which was followed by a second face-to-face meeting in February 2002.

A facilitated, Internet-based communication took place in the intervals between the meetings with the objective of producing a joint input for the World Summit on Sustainable Development later in 2002.

Our intent was to highlight controversial issues, analyze and test implicit assumptions, and, in response, explore new options. New options were identified through deliberation and the public use of argument, implying neither harmony nor consensus. The deliberations addressed some of the basic tensions inherent to IPR, such as private rights and collective goods, global justice, cultural pluralism, and the search for global governance.

The focus of the first meeting was to identify problems, questions, and concerns, not on positions and solutions. Although disagreement on positions was apparent, participants also found the beginnings of agreement on some problems, values, procedures, and visions of desirable futures. These shared notions provided a basis for sustaining the dialogue in the midst of existing controversy.

We chose three areas to include in the dialogue process:

- Access to human genetic material resources
- Access to essential medicines
- Protection of traditional knowledge

Governance and process

The WBCSD engaged an independent moderator team from the Berlin Science Center for Social Research (WZB) to assure neutral facilitation of the process. In addition, a Steering Committee (SC) of stakeholders was chosen by the participants, to oversee the dialogue between the meetings.

The WZB team collected the arguments put forward by the participants and summarized them in "argumentation trees" that comprised the pros and cons of specific controversial issues. The collection and survey of arguments were fed back to all participants for comment, revision, or amendment. The subsequent responses were again integrated into the collection of arguments, and the process continued.

From these responses and comments, the team compiled possible conclusions that formed the basis for discussions at the final face-to-face meeting. The content-related conclusions from the dialogue process are to be presented in a separate report to the WBCSD edited by the Steering Committee, as agreed by the participants.

Process related key findings

While this report will not comment directly on the conclusions of that process, here are some general reflections on the messages that we have all "brought home" from the dialogue.

The dialogue process has been a meaningful and productive exchange over contested issues that are normally dealt with by confrontation. Although the disagreements were significant, we achieved an element of cooperation by agreeing to engage in a sustained, comprehensive, and inclusive process of deliberation. The dialogue was thus clearly different from more ritual encounters in which industry meets stakeholders, listens to position papers, and leaves without a real and extended discussion, to start from scratch again at the next meeting.

The deliberative process was greatly enhanced by the neutrality and objectivity of the WZB team. Feedback from stakeholders indicates that the summaries of arguments may be useful beyond the dialogue process, to define common baselines for further debate. In addition, the contributions of activists from both sides — stakeholders and industry — were crucial in reaching significant conclusions.

One important general finding of the process is that when one is dealing with significant issues, one must also recognize the broader social and political context. For example, industry tends to take a pragmatic approach, singling out problems and looking for specific solutions, one by one. Stakeholders, in contrast, often adopt a holistic view, in which specific problems and solutions stand for underlying deep issues: inequality, power, global justice, and cultural authenticity. The willingness of industry to tackle some of the more open-ended issues may make possible a discussion of the specific and doable solutions.

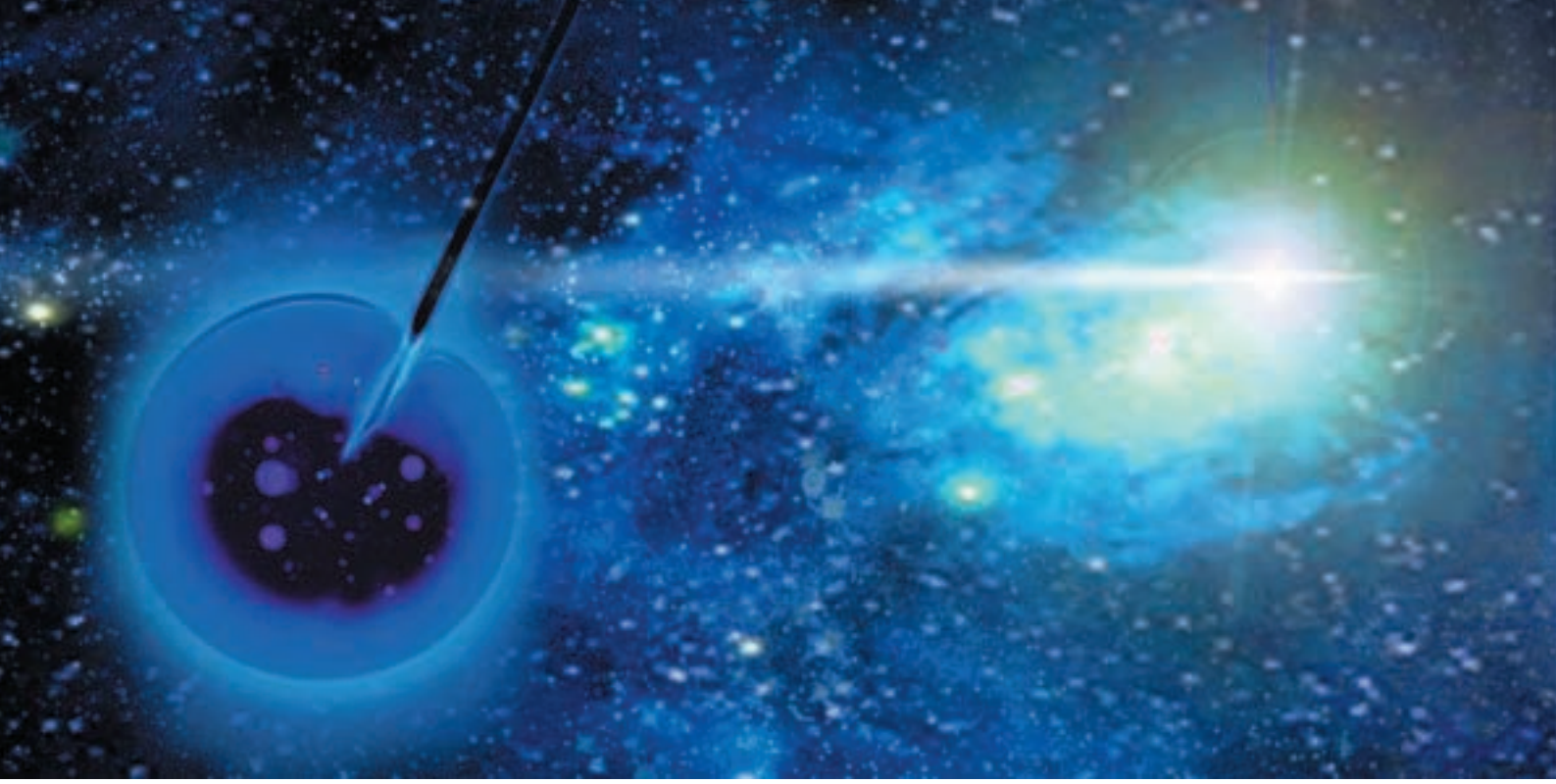
Nevertheless, all parties agreed that it is desirable to have reliable and generally accepted guidelines that address the contested issues. Such rules enhance the legitimacy of business strategies, but under certain conditions, as follows:

① The spirit and culture of compliance is essential. For the guidance to resolve the debated problems, the compliance must be genuine and not just formal. Sticking to the words of accepted rules is rendered useless if the function of the rules is missed or if it is evaded through complementary actions.

② Industry must be aware that even accepted and genuinely implemented rules cannot put debates and conflicts at rest once and for all. Public expectations and political agendas are constantly evolving, and hence "the rules" are changing also. Industry is used to operating in evolving environments of new technologies and market change. It is not realistic to expect that the political and legal environment for such operations will remain clear and stable over longer periods.

Accordingly, defining the conditions for legitimate business operations will continue to be a challenge. It is more appropriate to consider legitimacy — and public acceptance — as a project that never ends than as a result that can be achieved once and then enshrined forever in a set of rules.

Hence, the process of the dialogue the WBCSD was engaged in may prove to be as important as its products.



The way forward

Businesses that do not innovate will ultimately disappear. Innovation is the core of a successful long-term business. Innovation can lead to more business value if the business pursues a path to sustainable development and incorporates the issues of sustainability into its development processes.

The first step is to get started. Here are the key principles to follow:

① Build on existing processes, to the degree possible: R&D, market research, EH&S, capital approval, customer service, tech support

② Create enablers rather than governors

③ Get “outside the box”: find a way to obtain creative external inputs during development

Taking the first steps does not require a complete revamping of your current processes. You can make significant progress simply by enhancing your current systems to integrate sustainability thinking. So, what to do on "Monday morning"? Here is a summary of the major points we have made in the course of this report:

- Include sustainability among the drivers of your business (the "vision thing").

- Build in additional stimuli (include social and environmental issues). Whether by creating forums for greater awareness of issue, including nontraditional opinions, or setting up new business incubators specifically focused on sustainable development, add some spice to the mix of your business.

- Insist on tangible progress, and projects (are you "walking the talk"?). In the end, this issue is not just about fine words, but taking action. If you've built in good stimuli, you will be able to focus the innovative power of your organization on real problems.

- Create checkpoints in the development process (this is the "management thing"). Only you will know how many points of reassurance you need, but you will have to take some steps to ensure that your intentions are actually being followed. Often you'll be able to leverage existing processes; sometimes you will choose to implement special purpose reviews.

- Extend your creativity to the entire value chain. Your value chain is the first and often the easiest step "outside the box".

- Connect your innovation and business development processes to developing economies, not just your sales and marketing. Your creative people will encounter fundamentally different problems and also different ways of solving them, experiences that can enrich your market potential.

In the end, integrating sustainability and innovation is really about the business and managing it inclusively. As a leader of your business, you can investigate how well these principles are being followed. Where they are not, you can see that they are incorporated into normal business processes, and in so doing, you will invigorate the health of your business. Sustainably.

Project timeline

This report represents a continuation of work by the WBCSD in the areas of sustainability, innovation, and new technologies. The interested reader is directed to *Building a Better Future – Innovation, Technology, and Sustainable Development,* a progress report published in June 2000, led by Andrew Dearing, then of Shell International. This report examined company management of innovation and technology as well as stakeholder views of these practices. In addition, the scenarios developed by the WBCSD for global development, and for the evolution of biotechnologies were important starting points for our work.

1998

September
Stakeholder Dialogue: Innovation
Brussels (STM)

1999

March - September
Regional Dialogues
Taiwan, Philippines, Taiwan, Brazil, Argentina (STM)

March - November
Biotechnology Scenario Project

August
Innovation and Sustainable Development: A Corporate Survey published

September
Innovation and Sustainable Business workshop

November
Innovation and Technology Project launched at WBCSD Council Meeting
Berlin

December
Stakeholder Dialogue: Making Company-Led Innovation Fit for Sustainable Development
London and Washington, D.C.

2000

March - February
Scoping Meeting for ITSS project
Geneva

May
Scoping Meeting and Workshop with Assurance Team
London

Building a Better Future published

July
Assurance Team meeting on creating a robust dialogue process
Zurich

September
Workshop on overall project
Boston

November
Meeting on Information Technology Implications
Stuttgart

2001

February
Meeting on Information Technology
Geneva

March
Working group meeting
Montreux

May
Stakeholder Dialogue: Intellectual Property Rights
Montreux

July
Assurance Team Meeting
Geneva

July 2001 - February 2002
Electronic Stakeholder Dialogue: Intellectual Property Rights

September
Working Group Meeting
Kuala Lumpur

November
Assurance Team Meeting
Jongny sur Vevey
Switzerland

2002

February
Stakeholder Dialogue Meeting on Intellectual Property Rights
London

Working Group and Assurance Team Meeting
London

March
EIRMA Roundtable: Sustainable Development and the Innovation Process
Paris

April
Working Group Meeting
Stockholm

IPR stakeholder dialogue

UNDERLYING QUESTIONS

- What are the proper rules of access to genetic resources when used in the development and commercialization of products protected under IPRs?
- How should the line be drawn between proprietary knowledge, which may be legitimately reserved for private commercial use, and knowledge that must be placed in the public domain for free use by everyone?
- Will IPRs in modern biotechnology impose undue restrictions on the freedom of research?
- Will IPRs limit innovation or reduce the availability of useful new products?
- Will IPRs, if extended worldwide, put developing countries at a disadvantage by effectively barring them from access to protected knowledge and products, for instance, new medicines?

Selected cases were discussed that illustrated the above IPR topics in a paradigmatic way:

① Access to human genetic resources
② Access to essential medicines, and
③ Protection of traditional knowledge

Specific points of debate emerged as part of the dialogue on these three cases.

Access to human genetic resources

These questions comprise the access to human genes, the status of the data bases built up in functional genomics, and the scope of patent claims on human genes:

- How can access to human genetic resources (health data, family histories, blood samples, etc.) legitimately be obtained? Is informed consent of the donors required? Should state bureaucracies offer access to collections of materials they have within their jurisdiction? Should companies use such offers?
- Should companies provide for some kind of benefit sharing with the donors of genetic material?
- Shall HGR be collected by private companies and stored in private data bases? Is it legitimate to reserve exclusive access to data bases for just one company?
- Frequently, private companies collect genetic materials by appealing to altruism, conveying the message that the good will of the donor contributes to the public good. What would be a proper licensing practice in such a case?
- With respect to gene sequence data, there is a growing consensus that these data be disclosed and made freely available to all scientists. Are there reasons to apply that policy to data bases in functional genomics? Can one learn from the model case of the SNP (Single Nucleotide Polymorphisms) consortium?
- What is the proper scope for patent claims on genetic information? Should genes for which one function has been disclosed be protected like chemicals? Will the public interest be guaranteed in order to contain the monopolistic effects of IPRs and safeguard competition and the dynamics of innovations?

Access to essential medicines

Discussions in the project took into account the legal debates going on over necessary or suitable modifications of IPR regimes in order to allow for greater access to essential drugs. The participants considered the space to maneuver allotted to national governments under international treaties such as the TRIPS Agreement, in order to devise favorable access policies. The main focus was on elaborating whether the private sector could pursue innovative or alternative approaches to ensure access to essential drugs. Related questions discussed:

- What exceptions to intellectual property rights (e.g., early working provisions, compulsory licensing, etc.) should be provided for by national legislation, in order to permit the timely supply of reliable, affordable drugs but, at the same time, not stifle R&D for further development?
- What strategies can companies pursue, in order to facilitate access to essential drugs on reasonable terms, beyond meeting those obligations arising from stipulations laid down under international intellectual property rights treaties?
- Are drug donations a viable strategy to address access to essential medicines? What are the comparative merits (compatibility with business objectives) of instruments like differential pricing, voluntary licenses, cooperation with generic drug manufacturers, or donations?
- How can the needs of the global health agenda be reconciled with the provisions of international trade policies when access to essential drugs is concerned?

Participants OF THE DIALOGUE

Protection of traditional knowledge

Traditional knowledge of indigenous peoples, embedded in local cultures, can provide valuable resources for the development of useful technology. The focus was on intangible assets, that is, on the use of traditional knowledge, for instance, knowledge about the medicinal properties of a certain plant, and not on the tangible assets to which such knowledge refers, such as collecting the plant or its genes. Related questions discussed:

- What are proper rules for access to traditional knowledge? Is prior informed consent by the local communities imperative? For commercial exploitation only? Or also for the investigation and the disclosure of the knowledge?
- Under what conditions should traditional knowledge be considered the private (collective) property of the local cultures, or a part of the common heritage of humankind, respectively (e.g., knowledge already in the public domain)?
- What are proper rules for the exploitation and appropriation of the knowledge? Should there be a sui generis IPR-regime (registration and protection) for traditional knowledge?
- Do existing criteria adequately describe conditions for the granting of patents based on traditional knowledge? What strategies are appropriate to protect the traditional knowledge of indigenous and other local communities from being misappropriated or becoming unduly patented thereafter?
- What mechanisms are proper for sharing the benefits derived from the use of traditional knowledge between those who hold such knowledge and any third parties seeking legal access to it?

Name	Organization/Company
Argumedo, Alejandro	Indigenous People's Biodiversity Network
Arnason, Einar	Mannvernd, Iceland
Aumonier, Alain	Aventis
Biber-Klemm, Susette	University of Basel
Burkert, Frank	Bayer AG Leverkusen
Chavunduka, Gordon	Zimbabwe National Traditional Healers Association
Correa, Carlos	University of Buenos Aires
Cottier, Thomas	University of Berne
Cueni, Thomas	La Roche
Daele, Wolfgang van den	Science Center Berlin
Döbert, Rainer	Science Center Berlin
Dutfield, Graham	Oxford University
Eeckhaute, Jean Charles van	EU Commission
Ekpere, Johnson	Organization of African Unity
Flaherty, Margaret	WBCSD
Geffen, Nathan	Treatment Action Campaign
Geursen, Robert	Aventis
Gros, Florent	Novartis
Gupta, Anil	Indian Institute of Management
Harry, Debra	Indigenous Peoples Council on Biocolonialism
Henkel, Thomas	Bayer AG
Hubbard, Tim	Sanger Centre Wellcome Trust
Hvid, Nina	La Roche
Iwu, Maurice	Bioresources Development & Conservation Program
Jacobi, Markus	Aventis
Karol, Robin	DuPont
King, Stephen	Shaman Pharmaceuticals
Kuesters, Gabriele	Aventis
La Viña, Antonio	World Resources Institute
Leskien, Dan	European Parliament
Lindpaintner, Klaus	F.Hoffmann-La Roche
Love, James	Consumer Project on Technology
Meienberg, Francois	Berne Declaration
Moran, Katy	The Healing Forest Conservancy
Morrissey, Bruce	DuPont
Nogués, Julio	Former Worldbank Executive Director
Ouma, Chris	Action Aid
Pacón, Ana Maria	Peruvian Tribunal for Intellectual Property Protection
Rittenhouse, Dawn	DuPont
Rulon, Michael	WBCSD
Seiler, Achim	Science Center Berlin
Solaro, Patricia	Aventis
Stefansson, Einar	DeCODE genetics
Stevens, Ross	WBCSD
Stott, Michael	Glaxo SmithKline plc
Teitel, Martin	Council for Responsible Genetics
Wagner, Jost	Science Center Berlin
Webber, David	IFPMA
Weissman, Robert	Essential Action

Observers	
Bellmann, Christophe	ICTSD
Boughen, Sheena	Ecos Corporation
Frein, Michael	Church Development Service
Gettkant, Andreas	German Agency for Technical Cooperation
Kasten, Wolfgang	German Agency for Technical Cooperation
Mayne, Ruth	OXFAM
Smith, Andy	Earth Ethics
Watal, Jayashree	WTO

Facilitators	
Lair, Heather	Meridian Institute
Lesnick, Mike	Meridian Institute

Identifying stakeholders

A GUIDING MATRIX

	Employment/ Labor unions	Government	Regulations	NGOs	Academic institutions	Think tanks/ Research groups	Customers	Suppliers	Religious groups	Indigenous peoples	Youth/Women	Media
Who needs this innovation												
Who is directly responsible for decisions in the issues												
Who will be affected by any decisions around the issue												
Who will benefit												
Who will be harmed												
Who cares												
Who should care												
Who is not touched												
Who is afraid												
Who is representative												
Who is asking questions												
Who is impacted												
Who is concerned												
Who has the perceived power												
Who has the real power												
Who are the potential competitors of alternative products												
Who are potential aliens or opponents												
Who has been involved in the past												
Who has not been involved in the past												
Who holds positions of responsibility in SH organizations												
Who will promote a decision												
Who will obstruct a decision												
Who is influential in the area community, organization												
Who speaks for future generations												
Who /which group is underrepresented												

Resources

FOR TESTING SUSTAINABILITY DURING THE DEVELOPMENT PROCESS

The UN Global Compact

UN Secretary General Kofi A. Annan challenged world business leaders to "embrace and enact" the Global Compact, both in their individual corporate practices and by supporting appropriate public policies. These principles cover topics in human rights, labor and environment.

http://www.unglobalcompact.org/un/gc/unweb.nsf/content/thenine.htm

Sullivan Principles

The objectives of the Global Sullivan Principles are to support economic, social and political justice by companies where they do business.

http://globalsullivanprinciples.org/index.htm.htm

Global Environmental Management Initiative (GEMI)

Exploring Pathways to a Sustainable Enterprise: SD Planner™ represents a totally unique approach in how a company committed to operating globally in an environmental, economic and socially responsible manner can do so in ways that creates business value.

http://gemi.org

The Natural Step (TNS)

A framework based on science that serves as a compass for businesses, communities, government entities and individuals to make their activities more sustainable.

http://www.naturalstep.org

Earth Ethics

Assisting business and society in building a just and sustainable world where people from different perspectives and cultures are respected and valued for their contributions and recognize their place within a natural ecological community.

http://www.earthethics.com

McDonough Braungart Design Chemistry (MBDC)

MBDC's Design Paradigm models human industry on natural processes, creating safe and healthy prosperity.

http://www.mbdc.com

The Sigma Project

SIGMA aims to increase the social, economic and environmental performance of organizations — irrespective of size or sector — to develop an integrated approach to managing sustainability.

http://www.projectsigma.com

The Coalition for Environmentally Responsible Economies

CERES is a US-based coalition of environmental, investor, and advocacy groups that is home to the CERES Principles, a ten-point code of environmental conduct endorsed by many companies.

http://www.ceres.org

The Global Reporting Initiative

GRI is an international multi-stakeholder effort to establish a set of guidelines for corporate reporting on social, environmental and economic impacts that is utilized by over 125 international companies.

http://www.globalreporting.org

Participants

Working group leaders

Dawn Rittenhouse, DuPont
Patricia Solaro, Aventis

Working group

James Azim, British Standards Institution
Peter Baruch, Shell
Deanna Coles, BHP Billiton
Scott Daunheimer, Dow Corning
Pogo Davis, Conoco
Thomas Epprecht, Swiss Re
Markus Grauwiller, Cemex
Nobu Imajyo, Asahi Glass
Scott Johnson, SC Johnson
Gary Mayo, Visteon
Keith Miller, 3M
Heinrich Reitz, BASF
Thomas Streiff, Swiss Re
Martin Tanner, Novartis
Mark Wade, Shell
Bill Wallace, CH2M HILL
Akao Yamanaka, Hitachi Chemicals

Regional partners

René van Berkel, Curtin University of Technology (WASIG)
Liesel Gutierrez, BCSD Gulf of Mexico
Palgunadi Setyawan, DML Indonesia

Assurance team

Roger Baud, ETH
Sheena Boughen, ECOS Corporation
Wolfgang van den Daele, Berlin Science Center for Social Research (WZB)
Anil K. Gupta, Honeybee Network/Indian Institute of Management
Milda Hedblom, World Summit on the Information Society
Joyce Miller, Independent
Diane Osgood, Independent
Achim Seiler, Berlin Science Center for Social Research (WZB)
Andy Smith, Earth Ethics
Rainer Züst, ETH

WBCSD staff

Michael Rulon
Ross Stevens (Project Director, seconded from DuPont)

WBCSD resources

Samantha Chadwick
Stephanie Hanford
Robin Karol (former Project Director, seconded from DuPont)
Evi Vanakari-Renken

About the WBCSD

The World Business Council for Sustainable Development (WBCSD) is a coalition of 160 international companies united by a shared commitment to sustainable development via the three pillars of economic growth, ecological balance and social progress. Our members are drawn from more than 30 countries and 20 major industrial sectors. We also benefit from a Global Network of 38 national and regional business councils and partner organizations involving more than 1,000 business leaders globally.

Our mission

To provide business leadership as a catalyst for change toward sustainable development, and to promote the role of eco-efficiency, innovation and corporate social responsibility.

Our aims

Our objectives and strategic directions, based on this dedication, include:

Business leadership – to be the leading business advocate on issues connected with sustainable development.

Policy development – to participate in policy development in order to create a framework that allows business to contribute effectively to sustainable development.

Best practice – to demonstrate business progress in environmental and resource management and corporate social responsibility and to share leading-edge practices among our members.

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

Disclaimer

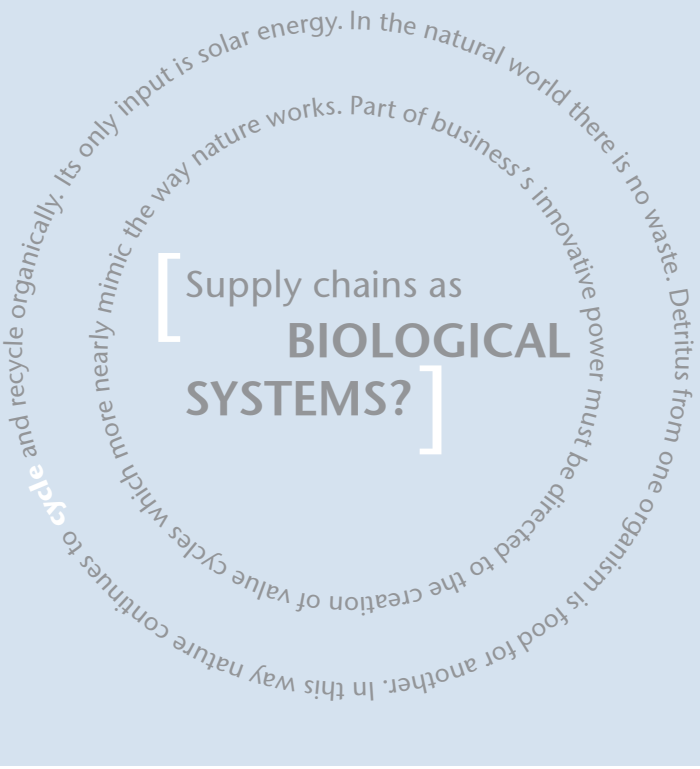
This report is released in the name of the WBCSD. Like other WBCSD reports, it is the result of a collaborative effort by members of the secretariat and executives from several member companies. The views expressed do not necessarily represent the views of every WBCSD member.

To order reports

EarthPrint
P.O. Box 119
Stevenage, Hertfordshire
SG1 4TP England
Telephone: (44 1438) 748 111
Fax: (44 1438) 748 844
Email: wbcsd@earthprint.com
Web: http://www.earthprint.com/

Graphic design: Michael Martin
Text: Ross Stevens, Michael Rulon, Dawn Rittenhouse and Patricia Solaro

ISBN 2-940240-27-2
Printed by Atar Roto Presse SA, Switzerland



4, chemin de Conches
CH-1231 Conches-Geneva
Switzerland

Tel: (41 22) 839 31 00
Fax: (41 22) 839 31 31

Email: info@wbcsd.org
Web: www.wbcsd.org