

# **Sustainable Business: Minimization vs. Optimization**

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## Pursuing Sustainability as Business Strategy

One can read the headlines and hear the stories everyday:

- "Little time to avoid big thaw, scientists warn"<sup>1</sup>
- "Wal-Mart recalls lead-laced baby bibs from China"<sup>2</sup>
- "Mickey Mouse to face random tests as Disney tackles toxic toys"<sup>3</sup>
- "Shareholder resolution at Hasbro encourages company to replace toxic chemicals in consumer products"<sup>4</sup>
- "BPA leaches from 'microwave safe' products"<sup>5</sup>
- "Study shows everyday items expose all of us to pollutants"<sup>6</sup>

'Sustainable development'—or simply, '*sustainability*'—is most commonly defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."<sup>7</sup> Since this first intergovernmental articulation of sustainability, in 1987, there has been a growing awareness of the economic, environmental and social issues associated with human activities, along with the creation of strategies to address those issues.

What began as a call by scientists, interest groups and a limited number of citizens has advanced into the public consciousness and changed consumer behaviors and decision-making. Through iconic issues such as carbon footprinting, green jobs, sweatshop-free clothing, lead in toys, BPA in water bottles, and "paper or plastic," sustainability issues have reached into the mainstream and are helping define brand image.

Today, consumers and the public expect companies, their government and institutions to operate within specific boundaries with respect to human health, the environment and social responsibility. They are judging actions on more and more criteria and adding sustainability performance to the expected components of a company's 'license to operate.' Increasingly, companies are working to meet those demands—

- Expanding their success metrics to include sustainability measures
- Addressing concerns of the SRI (socially responsible investing) community
- Attracting and retaining employees by becoming socially responsible workplaces
- Meeting the environmental and social procurement criteria of institutional customers

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<sup>1</sup> Spotts, Peter N. March 24, 2006. The Christian Science Monitor. [www.csmonitor.com/2006/0324/p01s03-sten.html](http://www.csmonitor.com/2006/0324/p01s03-sten.html)

<sup>2</sup> New York Times. May 3, 2007. [www.nytimes.com/2007/05/03/business/worldbusiness/03iht-bibs.1.5546069.html](http://www.nytimes.com/2007/05/03/business/worldbusiness/03iht-bibs.1.5546069.html)

<sup>3</sup> Quinn, James. Sep 11, 2007. Telegraph Media Group. [www.telegraph.co.uk/finance/markets/2815546/Mickey-Mouse-to-face-random-tests-as-Disney-tackles-toxic-toys.html](http://www.telegraph.co.uk/finance/markets/2815546/Mickey-Mouse-to-face-random-tests-as-Disney-tackles-toxic-toys.html)

<sup>4</sup> CSRwire. May 22, 2007. [www.csrwire.com/press/press\\_release/18003-Shareholder-Resolution-at-Hasbro-Encourages-Company-to-Replace-Toxic-Chemicals-in-Consumer-Products](http://www.csrwire.com/press/press_release/18003-Shareholder-Resolution-at-Hasbro-Encourages-Company-to-Replace-Toxic-Chemicals-in-Consumer-Products)

<sup>5</sup> Rust, Susanne and Kissinger, Meg. Nov 15, 2008. Journal Sentinel. [www.jsonline.com/watchdog/watchdogreports/34532034.html](http://www.jsonline.com/watchdog/watchdogreports/34532034.html)

<sup>6</sup> Hickey, Colin. June 12, 2007. Kennebec Journal. [kennebecjournal.maintoday.com/news/local/3991537.html](http://kennebecjournal.maintoday.com/news/local/3991537.html)

<sup>7</sup> World Commission on Environment and Development (Brundtland Commission). Our Common Future. [www.worldbank.org/depweb/english/sd.html](http://www.worldbank.org/depweb/english/sd.html)

- Shifting from governmental regulation to a new era of partnering for sustainability
- Responding to increasing concerns from consumers and local communities about the human health impacts of products, operations and facilities

More and more companies are recognizing the business potential inherent in the agenda of sustainability. A recent online survey conducted by the Economist Intelligence Unit and sponsored by SAS found 78% of managers said sustainability is important to their business strategy, fully 87% believe they will be important within five years, and they currently attribute 22% of their time to integrating sustainability initiatives into business strategy.<sup>8</sup> A 2008 survey of executives by IBM's Institute for Business Value found more than 50% think their corporate social responsibility activities are delivering a competitive advantage.<sup>9</sup> Stock indexes comprised of companies meeting sustainability and corporate responsibility criteria—such as the Dow Jones Sustainability Indexes (DJSI) and the FTSE4Good series—have outperformed stock indexes for the mainstream market.<sup>10</sup>

Sustainability has the potential to build business value via the following drivers:

- **Reduced risk and liability:** Auditing and optimizing operations to be safe for human and environmental health can reduce or even eliminate internal risks, liabilities and regulatory requirements.
- **Operating efficiencies and cost savings:** The efficient use of energy, water, materials and other resources can reduce expenditures and environmental impact.
- **Synergies with stakeholders:** The pursuit of a positive vision can inspire investor and customer confidence, strengthen employee commitment, and improve relations with public and private stakeholders.
- **Enhanced reputation and brand differentiation:** Sustainability innovation can help distinguish an organization and its brand from competitors, such as expanding the traditional market measures of quality—cost, performance and aesthetics—to add environmental and social benefits related to products, services and operations.

The first two areas listed above represent opportunities for creating internally-focused business value and can be described as primarily 'self-serving' for an organization. The last two areas can provide more externally-focused business value and social value as well. While the driver(s) of an organization's sustainability initiative do not necessarily predispose its outcomes, applying broader, externally-focused drivers can help build the most significant brand value over time.

Most business researchers recognize reputational enhancement and brand building (i.e., external foci) as the most effective means to develop long-term recognition and success in the marketplace. As a result, a company that moves beyond individual self-interest actually can secure self-interested achievements in the end. For example, a January 2004 survey of 132 participants in the World Economic Forum in Davos, Switzerland—mostly corporate CEOs and

<sup>8</sup> Economist Intelligence Unit and SAS. Nov. 11, 2009. Sustainability Initiatives Can Help Drive Corporate Growth, According to Economist Intelligence Unit Survey. [www.ethicalmarkets.com/2009/11/11/sustainability-initiatives-can-help-drive-corporate-growth-according-to-economist-intelligence-unit-survey](http://www.ethicalmarkets.com/2009/11/11/sustainability-initiatives-can-help-drive-corporate-growth-according-to-economist-intelligence-unit-survey)

<sup>9</sup> Preston, Rob. Aug 11, 2008. When Good Corporate Deeds Yield Good Returns. InformationWeek. 1198; ABI/INFORM Global. p. 56.

<sup>10</sup> Dow Jones Sustainability Indexes. October 2009. Dow Jones Sustainability World Index. [www.sustainability-indexes.com/djsi\\_pdf/publications/Factsheets/SAM\\_IndexesMonthly\\_DJSIWorld.pdf](http://www.sustainability-indexes.com/djsi_pdf/publications/Factsheets/SAM_IndexesMonthly_DJSIWorld.pdf)

leaders—indicated a widespread perception that reputation is a key measure of a company's success. The survey's respondents rated brand reputation/integrity as a more important measure of success than profitability, stock market performance or market share.<sup>11</sup>

Pursuing sustainability can provide business value that is derived from achieving internal efficiencies (a 'minimization' approach) and/or achieving external reputational enhancements (an 'optimization' approach). While both drivers are legitimate from a business standpoint, those that create positive brand recognition and stakeholder respect will create more extensive, longer-term value for the company, the environment and the larger society.

### **'Minimization': Pursuing Sustainability for Internal Value and Enhanced Efficiency**

The most likely opportunity for realizing a return on investment (ROI; or more correctly, savings on investment: SOI) from sustainability implementation is reducing purchases of raw materials, energy, water and similar resources, as well as reducing waste emissions.<sup>12</sup> Such 'eco-efficiency' provides tangible results that can enhance bottom-line business value, demonstrate a basic sustainability approach to stakeholders, and begin to reduce operating risks and liabilities. For example, researchers have found an inverse relationship between a company's total emissions, as reported to EPA's Toxic Release Inventory (TRI) Program, and its financial performance.<sup>13</sup>

The term 'eco-efficiency' evolved from the work of the World Business Council for Sustainable Development (WBCSD), a group of forty-eight industrial actors including Dow, DuPont, ConAgra and Chevron, founded in 1992, in response to the first United Nations Earth Summit. The WBCSD's founder, Stephan Schmidheiny, predicted in 1996 that "within a decade it is going to be next to impossible for a business to be competitive without also being eco-efficient—adding more value to a good or service while using fewer resources and releasing less pollution."<sup>14</sup>

### ***Limitations to an Eco-efficiency Strategy***

Pursuing only eco-efficiency—merely minimizing the environmental and social impacts of products, services and operations—cannot allow an organization to achieve true sustainability, or contribute at least as much benefit to the earth and society as it obtains (i.e., moving from degradation and even conservation, to restoration). While there are gains to be had from an eco-efficiency strategy, it primarily is a means of reducing unnecessary waste within the internal system and maximizing return (savings) on investment versus deriving leadership from a broader sustainability commitment or doing things in radically different or innovative ways.

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<sup>11</sup> Fleishman-Hillard, Inc. January 2004. 2004 Annual Meeting Survey. World Economic Forum. [www.trustenablement.com/local/World\\_Economic\\_Forum-Annual-member\\_survey\\_2004-factorsaffecting\\_business\\_success.pdf](http://www.trustenablement.com/local/World_Economic_Forum-Annual-member_survey_2004-factorsaffecting_business_success.pdf)

<sup>12</sup> Estes, Jonathan M. Oct 2007. The Real Return: To Gauge the True Value of Their Efforts, Facility Executives Should Look Beyond Cost Savings. *Building Operating Management*. 54, 10; ABI/INFORM Trade & Industry. p. 43. [www.facilitiesnet.com/bom/article.asp?id=7547](http://www.facilitiesnet.com/bom/article.asp?id=7547)

<sup>13</sup> King, A. and Lenox, M. 2001. Does it Really Pay to be Green? *The Journal of Industrial Ecology*. 5(1), pp.105-116.

<sup>14</sup> Stephan Schmidheiny, *Eco-Efficiency and Sustainable Development*, *Risk Management* 43:7 (1996), 51.

One important consideration is that gains resulting from eco-efficiency improvements are subject to the law of diminishing returns.<sup>15</sup> Minimization produces great value in the early stages of implementation, but after reaching a certain level of efficiency—getting the most out of every drop of water, every erg of energy, every ounce of material—improvements get incrementally more difficult and more expensive, as cost savings plateau or begin to disappear.

Furthermore, if a company has not found a way to turn its inputs back into productive use, it will need to buy more and more resources to keep up with new growth. At some point, a robust, growing company will outstrip any per-unit savings previously achieved through efficiency measures. And thus, in an expanding global economy, eco-efficient businesses will not be able to maintain current levels of resource use and impacts, let alone further the transition toward sustainable development. Macro-level studies bear this out—World Resources Institute researchers tracking long-term progress toward sustainability found that pollution and waste in Austria, Germany, Japan, the Netherlands and the United States increased by as much as 28 percent during the period 1975-2000, despite increasingly efficient use of resources.<sup>16</sup>

Decisions on whether to pursue new business activities often require quantifying expected costs and benefits and evaluating them using financial tools such as return on investment. Eco-efficiency programs can yield cost savings in areas such as energy, materials and regulatory paperwork. Such efforts can be justified by tangible, often short-term ROI (more correctly, SOI). However, the potential to measure ROI should not be the most important criterion for a company deciding whether and how to pursue sustainability. All seasoned business professionals know not every decision is based on a direct, immediate or even tangible ROI. Many core activities such as marketing, brand building and reputation management are not evaluated for action or inaction based on cost-benefit analysis—managers know such core areas are requisite to survival and license to operate, especially over time.<sup>17</sup>

Evaluating sustainability initiatives using only financial metrics distorts attention to quantifiable benefits and easily can mask the real opportunities inherent in the future. Implementing far-reaching sustainability programs usually requires more fundamental changes in organizational goal-setting and decision-making that may not readily pass a short-term financial test. Nonetheless, the long-term leadership opportunity, reputational implications and revenue prospects of credibly pursuing a socially responsible agenda can easily validate implementation over time. In fact, there is growing recognition of the importance of qualitative intangibles, such as reputation, on overall business value and ongoing competitiveness. In an article on corporate social responsibility (CSR), Allen White related, “intangibles play a significant and growing role in the assessment of value enhancement even if they seldom appear in quantitative form.”<sup>18</sup> Another Business for Social Responsibility briefing document also addresses the connections among CSR, intangibles and real value creation that is perceptible to shareholders and customers: “Investors intuit this relationship and customers respond to it, even while deficient accounting methods and financial reporting continue to play catch-up in a fast changing world in which intangibles frequently surpass tangible assets as sources of value creation.”<sup>19</sup>

<sup>15</sup> Papmehl, Anne. May 1, 2003. The Sustainability Advantage: Seven Business Case Benefits of a Triple Bottom Line. (Book Review). CMA Management. [www.allbusiness.com/management/561261-1.html](http://www.allbusiness.com/management/561261-1.html)

<sup>16</sup> Mathews, Emily. 2000. The Weight of Nations: Material Outflows From Industrial Economies. World Resources Institute.

<sup>17</sup> Preston, Rob. Aug 11, 2008. When Good Corporate Deeds Yield Good Returns. InformationWeek. 1198; ABI/INFORM Global. p. 56.

<sup>18</sup> White, Allen L. February 2006. Intangibles and CSR. Business for Social Responsibility.

<sup>19</sup> Business for Social Responsibility. Feb 2006. Business Brief: Intangibles and CSR.

It is critical to note that, in the end, successful eco-efficiency implementation does not prevent the organization from creating problematic impacts that may harm human health, the environment, and society. Although eco-efficiency efforts have reduced the negative impacts, those impacts still may be significant to government regulators, customers, employees and other stakeholders. In this vein, changing a company's vision and goals to move beyond eco-efficiency toward true sustainability is important because, in the words of architect William McDonough and chemist Michael Braungart, "as long as modern industry is so destructive, attempting only to make it less bad is a fatally limited goal... What about an entirely different model? What would it mean to be 100 percent good?"<sup>20</sup> Ideally, a company's near-term financial savings from efficiency gains (e.g., energy efficiency) can be invested into longer-term, broader sustainability initiatives (e.g., transitioning toward powering with 100% renewable energy).

Perhaps most importantly, eco-efficiency alone is not a means of innovation for engendering long-term business and social value. Positive, tangible sustainability leadership allows for true synergies with stakeholders, enhanced reputation and brand differentiation—and thus, long-term increases in external support, customer commitment and sales. The most forward-looking leaders will move beyond a reactionary, defensive approach on sustainability concerns, to develop more proactive brand tactics among their personnel and partner organizations.

### **'Optimization': Pursuing Sustainability for External Value and Enhanced Reputation**

Although eco-efficiency is not a means to business innovation or building reputation over the long-term, it can complement strategies that seek to optimize, rather than simply limit, the ecological and social impacts of business. Optimizing strategies can put eco-efficiency to work in the service of a larger, more positive vision of commerce, redirecting decision-making from trying to minimize the effects of inherently unsustainable activities to envisioning and pursuing wholly sustainable goals. For example, building a factory that uses less energy derived from fossil fuel is a minimizing strategy—it cuts waste and pollution and contributes less to climate change and other impacts associated with energy production, but pollution still is created. Powering a factory with clean, renewable wind energy is cost-effective in many markets and an optimizing strategy—produces no harmful emissions, is climate-neutral, and promotes domestic energy security. For the wind-powered facility, engineers still should design it to be as energy efficient as possible, but it's the optimizing vision that drives the goals and actions. This point is echoed by William McDonough: "What we need to do is become incredibly efficient, say with energy and materials, and at the same time become incredibly effective by doing the right thing... This is what really represents leadership."<sup>21</sup>

As a result, the headlines are beginning to change, across every sector of society— change is occurring among citizens, consumers, businesses, governments, institutions and non-governmental organizations. Individuals and groups are transitioning toward sustainability visions built on innovation and *optimization*:

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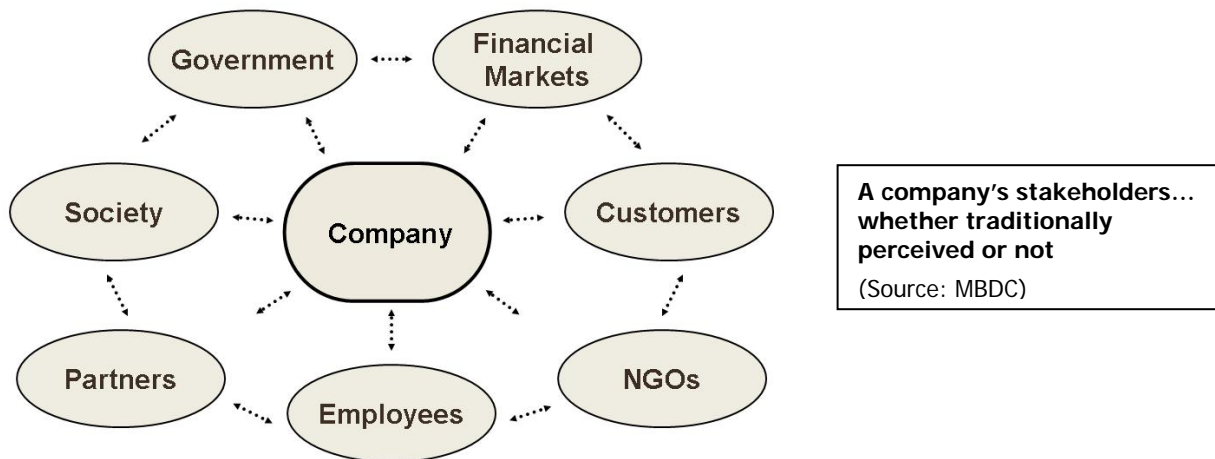
<sup>20</sup> McDonough, William and Braungart, Michael. 2002. *Cradle to Cradle: Remaking the Way We Make Things*. North Point Press. pp. 65-67.

<sup>21</sup> McDonough, William (video). July 2009 Milestone Meeting: Sustainability Index. Walmart website. [walmartstores.com/Video/?c=624](http://walmartstores.com/Video/?c=624)

- “Businesses embracing green procurement, survey finds”<sup>22</sup>
- “The end of garbage”<sup>23</sup>
- “Good design can mean dated products can have renewable life cycles”<sup>24</sup>
- “The Next Industrial Revolution”<sup>25</sup>
- “Cradle to Cradle, brought to you by Uncle Sam”<sup>26</sup>

Optimization, then, moves beyond a basic assumption about commercial activity. Whereas the conventional wisdom assumes that ecological damage is an inherent part of the production and consumption of goods, optimizing strategies see pollution and waste as signals of design failure. Responding to these signals, and addressing design problems at their source, transforms the landscape of strategic decision-making, opening up myriad opportunities for leadership and profitable innovation. Indeed, understanding the transformative power of design is the key to sustainability and 21<sup>st</sup> century business success.

Synergistic, positive stakeholder engagement and reputational enhancement are two measures of pursuing an optimization approach to sustainability. However, legitimacy and achievement in these areas requires a company to attribute more than a passing interest and limited resources. Successful stakeholder collaboration and brand improvement are built on truly listening to external concerns, as well as responding to them and reorienting sustainability implementation to continually address those concerns over time. As Michael Porter and Mark Kramer write, “Perceiving social responsibility as building shared value rather than as damage control or as a PR campaign will require dramatically different thinking in business.”<sup>27</sup> A company’s new goal should be to perceive the much larger map of stakeholders that affect it (see diagram below) and create value for more than just shareholders.



<sup>22</sup> Climatebiz.com. Aug 6, 2007. [www.climatebiz.com/news/2007/08/06/businesses-embracing-green-procurement-survey-finds](http://www.climatebiz.com/news/2007/08/06/businesses-embracing-green-procurement-survey-finds)

<sup>23</sup> Gunther, Marc. March 14, 2007. Fortune. [money.cnn.com/magazines/fortune/fortune\\_archive/2007/03/19/8402369/index.htm](http://money.cnn.com/magazines/fortune/fortune_archive/2007/03/19/8402369/index.htm)

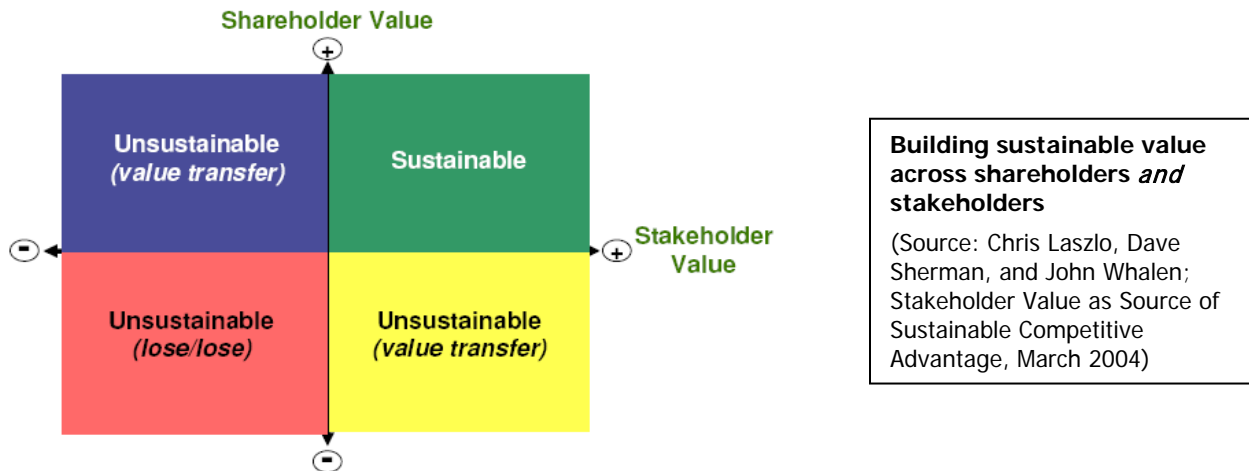
<sup>24</sup> Huang, Lily. Oct 24, 2008. Newsweek. [www.newsweek.com/id/165375](http://www.newsweek.com/id/165375)

<sup>25</sup> McDonough, William and Braungart, Michael. Oct 1998. The Atlantic. [www.theatlantic.com/doc/199810/environment](http://www.theatlantic.com/doc/199810/environment)

<sup>26</sup> Uydess, Steve. Earth911.com. [earth911.com/blog/2008/12/01/cradle-to-cradle-brought-to-you-by-uncle-sam](http://earth911.com/blog/2008/12/01/cradle-to-cradle-brought-to-you-by-uncle-sam)

<sup>27</sup> Porter, Michael E. and Kramer, Mark R. Dec 2006. Strategy & Society: The Link Between Competitive Advantage and Corporate Social Responsibility. Harvard Business Review. pp. 78-92.

The following chart demonstrates the importance of an organization broadening its efforts to build joint shareholder and stakeholder value, which allows sustainable growth and does not sacrifice one at the expense of the other, which is unsustainable. A sustainability strategy excels by making the company focus on the needs and interests of other individuals and groups, which actually enhances the organization's capacity to achieve its own growth goals.



Leadership is the key to actualizing business sustainability—rising above the fray of shareholder resolutions, environmental group campaigns and reactionary decision-making—by defining and achieving a proactive, tangible vision that is entirely positive and demonstrating performance within economic, environmental and social spheres. Taking a sustainability leadership position is becoming increasingly important across all industries and can benefit a company in various ways, if an organization is ready to do the necessary work, change its business objectives and decision-making, and transform the way it interacts with its stakeholders.

### ***Orienting Toward Sustainability Innovation and Leadership***

A company pursuing sustainability as a growth opportunity engenders a focus on enhancing benefits (not only reducing costs) through its decision-making and actions—taking an approach of optimization rather than minimization. The organization can understand the perspective of “people, planet and profits” as expansionist and enabling leadership through the achievement of advanced success metrics.<sup>28</sup> Change towards sustainability requires a company to reorient its goals, employ innovation and creativity, prevent problems and waste from being created in the first place, utilize more comprehensive metrics, and engage all stakeholders in both the vision and implementation of a positive future.

The most successful efforts will define a vision, goals, strategies, trajectories and implementation timelines from the beginning and involve a range of stakeholders in establishing those components. As a consulting firm, MBDC assists clients—for-profit, non-profit, governmental and institutional—to guide this planning and execution using its Cradle to Cradle® framework, which moves beyond eco-efficiency toward optimization of positive impacts (‘eco-effectiveness’) and eliminating the concept of waste through innovative design. The framework

<sup>28</sup> Wikipedia “Triple Bottom Line.” en.wikipedia.org/wiki/Triple\_bottom\_line

can be integrated into product design, material selection and operations, as well as help build an organizational structure and decision-making system capable of achieving the chosen sustainability objectives.

Orienting a company toward optimization can entail the following four-stage process, as a proven mechanism pursued by MBDC and its clients:

- **Education and Strategy:** The goal of this stage is initiating an organization's sustainability transition. Individuals and teams within a company learn more about sustainability innovation, discuss opportunities and challenges being faced, evaluate strengths and weaknesses, list potential goals, and begin to align their strategy-setting with this perspective. Ideally, there are open-forum educational/strategy sessions, as well as facilitated discussions among functional groups (e.g., product design, supply chain/procurement, operations, marketing/brand management, customer relations), to support the needs of organizational components and the organization as a whole.
- **Inventory:** The goal of this stage is collecting data on current sustainability performance. The work consists of assembling quantitative and qualitative data on current sustainability performance and previous initiatives. Data can be collected by interviewing personnel, reviewing reports and databases, and exploring current organizational and sustainability objectives. Various questions may be posed, such as: "What sustainability criteria are used in making purchasing decisions?"; "What metrics are used to measure operations success related to sustainability?"; and "How are decision-making processes, employee input and reporting relationships currently being leveraged for sustainability?"
- **Assessment:** This stage has the goal of evaluating current sustainability performance and aligning resources for continuous improvement. During this work, the information collected during the Inventory stage is assessed and initial findings are documented. From these results, the company can tailor its future sustainability vision and goals, draft an implementation plan with milestones and timelines, and begin to demonstrate action through pilot projects in one or more areas, such as: product design for recyclability/compostability, material selection for human and environmental health, energy and climate change, water stewardship, social responsibility, and stakeholder engagement.
- **Optimization:** The goal for this stage is to achieve some or all of the goals established during the previous stages. Work here allows the company to excel relative to the vision and demonstrate actual improvement to its stakeholders. The measures of success could include one or more of the following: assess and select products ingredients for their potential hazards to human and environmental health, activate strategies for fully recycling or biodegrading a product, power manufacturing using 100 percent renewable energy, ensure any water released to the environment has the same quality as before it was removed from a water source, maintain socially responsible relationships with all stakeholders.

Sustainability optimization may not be achieved easily or quickly, and may require continuous improvement over multiple iterations. For example, performance and cost considerations may prevent preferred ingredients from coming into use in the short term, but at least a company is prepared with an eco-effective solution once other market conditions are met. Although the

goal may take a long time to fully realize, a company should accept the challenge, establish a vision and trajectory toward the ideal, and begin to implement strategies to help achieve it. Leveraging this expanded notion of 'good' design can benefit not only the individual organization, but also its stakeholders, the environment and the larger society over time.

### *Engaging Personnel in the Transition*

Employees are a critical set of stakeholders in a company's transition toward sustainability optimization—the work cannot be completed without their participation, support, innovation, creativity and straightforward hard work. The following example questions illustrate what reorienting individual roles toward sustainability can mean for an organization, and support the facilitated discussion MBDC conducts with its clients regarding their sustainability initiatives:

#### Executives and Business Managers

- What is our sustainability perspective?
- How can sustainability innovation provide new opportunities and enhance our competitiveness?
- What are the benefits of enhancing our reputation and moving beyond regulation? How do we?

#### Finance Managers/Accountants

- What would a sustainability initiative mean for cost-effectiveness? Are we correctly measuring all costs, including externalities?
- How do accounting principles reflect sustainability initiatives? Could they be adjusted to better account for value in terms of sustainability?
- Is there value in pursuing a 'product of service' strategy? Does the 'servicing/leasing' concept increase the profitability of designing for recyclability?

#### Product Designers

- How can we select materials for characteristics beyond performance, price and aesthetics?
- How can we implement Design for Modularity, Design for Disassembly, and Design for Recycling methods? How can we adjust the materials palette and other product attributes to maximize these design strategies?
- What should be our future material R&D priorities, based on the current gaps in achieving our success metrics?

#### Procurement Managers

- What is our current materials palette for products? What materials are used in our manufacturing processes? How will these materials rate according to our new metrics?
- How can we work with suppliers to select the most appropriate materials today and develop the materials of the future?
- Can we partner with other manufacturers to purchase sustainable materials together and reduce costs (i.e., 'intelligent materials pooling' strategy)?

#### Operations Engineers

- What success metrics should we use for renewable energy and energy efficiency?
- How can we collaborate with vendors and manufacturers to develop and use next generation equipment and processes to enhance operational sustainability?

## EH&S Specialists

- What does the concept of 'safe materials' mean for our products and operations?
- What, in general, are the human and environmental health issues of the materials that our industry currently uses in products and processes?

## Customer Service Representatives

- What would the proposed sustainability changes mean from the perspective of customer preferences?
- How can we promote our product recovery system to customers and emphasize their role within it? How can we maximize their participation?

## Public Relations Professionals

- What is our company's process for selecting safe materials? Do we emphasize an approach that is 'preventive', hazard-based, risk-based or responds to emerging problems?
- How can we promote sustainability-driven innovation, new product attributes and company initiatives to the marketplace, government regulators and other stakeholders?

## Product Stewardship Managers

- What will be our success metrics for post-use recoverability (e.g., modularity, ease of disassembly, reusability, recyclability)?
- What will be our success metrics for the recovery system (e.g., volume of material flows, amount of cost savings/avoidance, degree of customer participation, ability to cycle materials safely)?
- How can we recover, reuse and recycle products and materials at their highest level of value? Are there opportunities to collaborate with customers, other companies and/or other industries profitably to accomplish this?

## Real-World Examples of Implementation

The following are examples of MBDC's work with clients from various industries, outlining the work completed toward achieving sustainability within the Cradle to Cradle® framework.

### *Herman Miller*

The concepts of indoor air quality (IAQ) and Cradle to Cradle design took foothold first within the architecture and design community, since William McDonough was an architect by training and off-gassing within enclosed spaces and sick building syndrome were of critical importance during the 1990's and early 2000's.<sup>29</sup> Since then, the Cradle to Cradle perspective and brand has become a point upon which different companies compete for leadership.

Herman Miller is a great model of how one company's comprehensive long-term commitment to sustaining its industry, has led to the integration of eco-effective design and business practices.

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<sup>29</sup> BusinessWeek. June 5, 2000. Is Your Office Killing You? [www.businessweek.com/2000/00\\_23/b3684001.htm](http://www.businessweek.com/2000/00_23/b3684001.htm)

From its inception, Herman Miller has placed emphasis on being a responsible environmental steward, and in 1997, the company received BusinessWeek's first-ever "Good Design is Good Business" award for the GreenHouse manufacturing and office complex. The buildings, designed by architecture firm William McDonough + Partners, nourished the surrounding landscape and reaped the benefits of enhanced employee productivity and reduced operating costs.

When it came to production taking place under the GreenHouse roof, Herman Miller clearly understood that its impact extended throughout global supply and distribution chains, and was therefore seeking to develop two essential things: a more complete knowledge about the materials they used; and a reliable, coherent means of measuring their environmental performance. Company leaders turned to MBDC and its material assessment protocol.

Herman Miller's senior staff challenged MBDC to design a blueprint for integrating Cradle to Cradle design into the company's product development system. Team members quickly realized that to integrate this type of design effectively, Herman Miller would need to enhance its internal staff resources. At MBDC's recommendation, the advisory group assembled its Design for Environment (DFE) team hiring a chemical engineer to integrate MBDC assessments into its materials database, and a purchasing agent to connect Herman Miller's supply chain and purchasing teams.

Working closely with the DFE team, MBDC developed a tool to transfer assessment findings from the Cradle to Cradle assessment process into data that could then be used directly by Herman Miller for material selection and product design. The assessment system also served a few different functions: it analyzed and scored materials for their human and environmental health effects, recyclability, percentage of recycled content and/or use of renewable resources; and it evaluated the disassembly potential of product design. The tool was designed to help engineers score and improve the attributes within each design iteration.

Once a more accurate picture of materials and environmental implications was achieved, Herman Miller and MBDC then began to engage suppliers as partners in applying the new design criteria. Initially, MBDC assessed more than 100 materials and the results were entered in a database used by engineers in product development. Suppliers then were informed of the assessment findings and asked to investigate possible alternatives for problematic or questionable materials. The process worked so well that Herman Miller now asks suppliers submitting new materials to provide data for the MBDC's human and environmental health criteria upfront, as part of the procurement decision-making.

As a sustainability and business leader, Herman Miller continues to implement Cradle to Cradle design and realizes numerous advantages: adding coherence and streamlining to their purchasing process makes Herman Miller a more resilient and flexible market player; in the manufacturing process, there are financial benefits in avoiding employee exposure to harmful chemicals and reducing regulatory costs; by designing products for end-of-life material recovery, the company creates a source of more readily available raw materials; and actively benefitting from marketplace gains for products with strong environmental performance.

Herman Miller and MBDC's collaboration have helped to define what sustainable design means for the furniture industry and have enhanced the company's products and internal capacity in the process. Herman Miller's efforts have helped take the Cradle to Cradle framework from

poetry to practice by integrating the principles broadly throughout the entire company. Success in sustainability will be measured and has been achieved on many fronts, and will continue to guide Herman Miller's long-term journey.

### **Lessons:**

- A history of environmental ethics, derived from the company's founder, creates DNA which is critical to developing and maintaining a sustainability focus over time.
- Being able to meet customers' values and needs, especially in the architecture and design community and state and local government procurement, is extremely important.
- Integrating a Design for Environment approach directly within the product design process allows quantitative and qualitative measures for toxicity, Design for Recyclability, material recyclability, and other criteria to be addressed as tangible solutions for sustainable design.
- It is critical to have close collaboration with material suppliers, in order to leverage their sharing of ingredient data and work to optimize formulations as necessary—after all, Herman Miller can't manufacture products without its suppliers.

### ***Nike***

What started out as a response to external critics on issues such as child labor, worker health and safety, and environmental degradation surrounding contract manufacturing facilities transitioned into one of the most robust social responsibility, sustainable product design and material selection programs of any consumer brand in the world.

In the early 1990s, a small group of Nike designers and managers began investigating in the idea of sustainable development. The name Nike has become synonymous with innovation and performance, and they have staked claim to being the cutting-edge leader in their industry, though this time the innovation was directed towards its impact on people.

The newly formed Nike Environmental Action Team (NEAT) focused on Nike's operations and began asking questions that would ultimately transform the company's understanding of itself and its mission: What are the long-term environmental and social impacts of the athletic footwear industry? How does a company with annual revenues in the billions and with hundreds of contract factories worldwide profitably integrate ecology and social equity into the way it does business?

The members of NEAT researched various approaches to sustainability and decided that the innovative concept of Cradle to Cradle design was a good fit with Nike's internal culture. They began to perceive sustainable design as a new performance measure, and in 1996, just three years after the formation of NEAT, Nike contracted the architecture firm William McDonough + Partners to design a state-of-the-art campus for its European Headquarters in the Netherlands. The result was an inspirational working environment providing the space for re-connection with nature and colleagues. With their internal working environment in a healthier place, Nike next focused on its products.

Could Nike integrate Cradle to Cradle thinking into product design, manufacturing and customer relationships? Nike's first steps toward eco-effective product design began with its use of MBDC's material assessment process. This determined the chemical composition, human and environmental impacts of the materials, and manufacturing processes used to produce athletic shoes. This effort required collaboration among Nike, MBDC and its material suppliers, who were audited against the company's emerging criteria for sustainable design. In partnership, Nike and MBDC identified materials that met or exceeded Nike's design guidelines, and added those components to the growing palette of preferred materials for use by product designers.

Ultimately, Nike is working toward a Cradle to Cradle manufacturing and product life cycle system, to eliminate the concept of waste and enhance the company's sustainability performance. Darcy Winslow, former Senior Advisor of the Nike Foundation, characterizes Nike's product design goals in this way:

"Product innovation and performance remain Nike's first priority, but our sense of design excellence now includes a commitment to ecological intelligence, an awareness of the impact of our products on the natural world, and in general our responsibility as a global corporate citizen... Our goal is to take responsibility for our product through its entire life cycle."

Nike's sustainability initiative has included not only its footwear, but also apparel and equipment. Heidi McCloskey, Global Sustainability Director for Apparel, frames the value to Nike:

"By taking responsibility for the chemicals and materials that make up Nike's products and designing out the things that have long-term cost to people's health and the environment, we're in a much better business position."

Although Nike realizes it has much work ahead to completely harmonize its product life cycles and operations with the principles of sustainability, it is progressing toward that goal. Nike recently introduced its Considered footwear line which, according to the company's website, "grew out of our commitments to design innovation and to sustainability, and it pulls from our best work on a wide range of products." Nike is signaling its design intentions for the future and embodying innovation and performance for its entire industry.

### **Lessons:**

- Starting from a reactive position by being attacked can provide the greatest source of sustainability inspiration and innovation.
- Nike pursued a successful joint approach for improving material chemistry with suppliers: provide a Restricted Substances List of ingredients to move away from (i.e., the low bar), while also outlining new design goals for material health and R&D collaboration.
- The company successfully has taken in-house much of the ideas and analysis of material optimization, by hiring chemists and having them work directly between material suppliers, product designers, advanced material researchers and purchasing agents.
- Setting both long-term vision or ethic and short-term actions permits every member of a company to understand and actualize a sustainability initiative, as well as tangibly define the objectives to external stakeholders.

## *United States Postal Service*

The United States Postal Service (USPS) has pursued the Cradle to Cradle framework as part of its efforts to differentiate itself from its competitors through sustainability, as well as demonstrate the range of services it can provide to its customers.

Beginning in 2004, MBDC worked with USPS to assess, work to optimize and certify its packaging items. Starting even with only 10 Priority Mail packages, the supply chain quickly grew to include 200 materials and 1300 ingredients—demonstrating the unexpected complexity of packaging items. During that process, MBDC helped identify large-volume problematic components primed for optimization.

During the period of 2005-2006, MBDC worked with USPS and its suppliers to reformulate inks and adhesives for human and environmental health, without interfering with existing cost and performance. For paper materials, suppliers conducted sample testing for chlorine and heavy metals and MBDC researched polymer alternatives.

With MBDC launching its product certification program in 2005, USPS then decided to have packaging certified from the lines of Priority Mail, Express Mail, ReadyPost, and Continuity Menuboards (signage for post office lobbies). The Postmaster General and an MBDC staff member launched the Cradle to Cradle Certified<sup>CM</sup> packaging at a May 2007 press conference at the National Press Club. Throughout this work and continuing work on new products to be certified, over 140 SKUs have been certified, ingredient data has been collected from over 250 suppliers, and over 1800 ingredients have been cataloged.

USPS has now gone further than any other shipping service provider in understanding its ingredient chemistry for human health, environmental health and recyclability attributes, down to the level of 100 ppm (0.01%). As a result, the organization is exceeding regulatory requirements (e.g., FDA) and industry averages for ingredient data knowledge. The Postal Service is working to eliminate hazardous ingredients from its packaging, with its suppliers' collaboration, and also applying aggressive sustainability criteria, while maintaining cost and performance. Where preferred ingredient chemistry was identified, USPS and MBDC created contract modifications to maintain suppliers' use of these materials.

As an extension to this packaging work, MBDC also audited the handling and end-of-life disposition of small electronics recovered through the USPS Mail-Back pilot program and managed by Clover Technologies Group. USPS and MBDC understand the importance of safely managing e-Waste and the potential reputational impact, as evidenced in a recent video from CBS News 60 Minutes.<sup>30</sup>

MBDC continues to help USPS communicate its leadership and "green" branding, by speaking at the National Postal Forum, recommending USPS be featured in The Sundance Channel series Big Ideas for a Small Planet, providing feedback on the [www.usps.com/green](http://www.usps.com/green) website, and delivering messaging recommendations on USPS and suppliers' promotional efforts. MBDC also advises USPS sustainability decision-making, as it continues to define what eco-effectiveness means for the largest shipper in the United States.

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<sup>30</sup> [www.cbsnews.com/video/watch/?id=4586903n](http://www.cbsnews.com/video/watch/?id=4586903n)

## Lessons:

- A company can use sustainability as a market differentiator and enhance its definition of 'quality,' to include human health, environmental and social responsibility attributes, to meet growing questions and concerns by stakeholders.
- USPS is defining itself through expanded sustainability services, such as adding containers for recycling used packaging and unwanted mail within its lobbies, as well as providing safe recovery and recycling of small electronics products.
- USPS is challenged by a complex, multi-level supply chain that reduces its leverage on any one supplier. Continuous education about the new design criteria and collaboration for ingredient optimization can help transition a supply chain over time.
- The security and performance requirements inherent in packaging creates challenges for ongoing ingredient R&D with material suppliers.

## Conclusion

Sustainability leadership will continue to be an important opportunity for companies in the future. The recommended approach is to work on the side of optimization (versus minimization or efficiency), work collaboratively with stakeholders, provide tangible metrics of organizational actions, build a positive reputation, and demonstrate continuous improvement in sustainability performance over time.

MBDC, as creators and implementers of the Cradle to Cradle® framework, which includes an engaging vision of sustainability optimization and specific steps to achieve it, has learned from its work with clients throughout various industries and can provide examples of how companies can truly lead. There are ways to truly "do well by doing good" and benefit the larger society, as well as the bottom line.

## About MBDC

MBDC (McDonough Braungart Design Chemistry) is a consulting and certification firm founded in 1995 and assists clients to become environmental leaders and create positive footprints on the planet by implementing the Cradle to Cradle® framework. The framework is based on the book *Cradle to Cradle: Remaking the Way We Make Things* written by MBDC co-founders, internationally recognized architect/designer William McDonough and chemist Dr. Michael Braungart, published in 2002 by NorthPoint Press.

MBDC has two primary service offerings: Cradle to Cradle® Certification is a rigorous and comprehensive certification program that evaluates products and materials for human health, environmental health and recyclability. Cradle to Cradle® Consulting helps clients integrate the larger Cradle to Cradle framework to optimize product life cycles, organizational operations and decision-making. MBDC works with global clients within various sectors and industries.