

BEYOND SUSTAINABILITY

CRADLE TO CRADLE®
SCIENCE, INNOVATION + LEADERSHIP



McDonough Braungart Design Chemistry



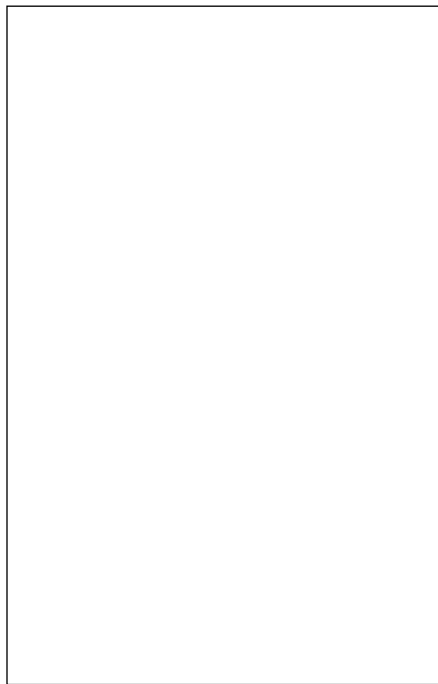
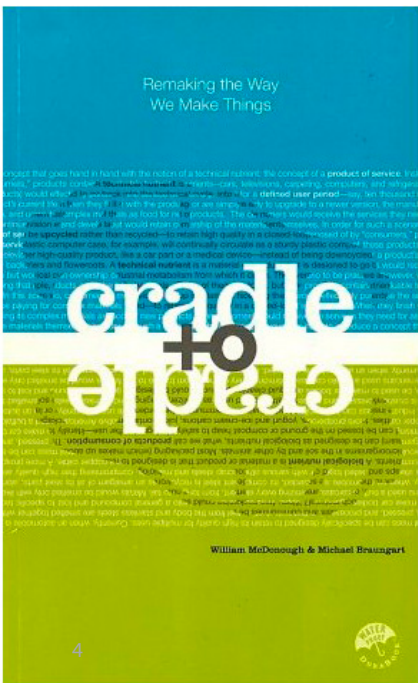
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LEADING COMPANIES TOWARDS SUSTAINABLE GROWTH



McDonough Braungart Design Chemistry (MBDC) is a firm founded in 1995 by world-renowned architect William McDonough and chemist Dr. Michael Braungart. They are co-authors of *Cradle to Cradle: Remaking the Way We Make Things* (2002), widely recognized as one of the most consequential ecological manifestos of our time, and *The Upcycle: Beyond Sustainability--Designing for Abundance* (2013). These books define the Cradle to Cradle principles and illustrate the concepts using the work of MBDC over the past 17 years helping clients go beyond minimizing harm and towards a wholly positive impact on the planet.

MBDC leads companies towards sustainable growth by integrating the Cradle to Cradle® framework into corporate strategy, communications, operations, supply chains, and product designs. Using the process of inventory, assessment, and optimization, MBDC provides the technical expertise to help companies develop solutions around material health, material reutilization, renewable energy use, water stewardship, and social fairness. We partner with clients throughout various sectors and industries to provide **scientific evaluations**, spur **innovation**, and inspire **leadership**.



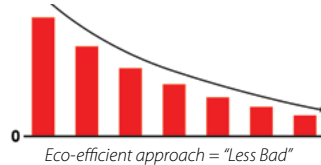
William McDonough, FAIA, Int. FRIBA is a globally recognized leader in sustainable development. Trained as an architect, McDonough works as an advisor and designer at all scales. Time magazine recognized him in 1999 as a “Hero for the Planet,” stating that “his utopianism is grounded in a unified philosophy that—in demonstrable and practical ways—is changing the design of the world.” In addition to his work with MBDC and William McDonough + Partners (architecture and urban design), McDonough advises major enterprises including commercial and governmental leaders worldwide.

Dr. Michael Braungart is founder of scientific institute EPEA International Umweltforschung GmbH in Hamburg, Germany. He is a professor of Process Engineering at the University of Lüneburg and professor at Erasmus University of Rotterdam. He is co-founder and scientific manager of Hamburger Umweltinstitut (HUI) (a non-profit research center), as well as director of Braungart Consulting in Hamburg. He works with global companies in a range of industries to design eco-effective products and business systems.

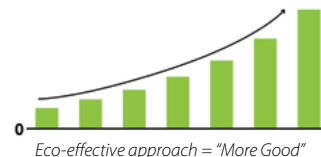
CRADLE TO CRADLE



Cradle to Cradle® design is fundamentally about improving product quality by moving from simply being “less bad” to becoming “more good.” Conventional **eco-efficient** demand side approaches often simply seek to reduce or minimize damage, and the approaches typically portray reducing a negative footprint. Efficiency is just good business.



By adding what we call **eco-effective** supply side approaches and integrating positively defined goals based on Cradle to Cradle values and principles, we are able to direct innovation and leadership towards a positive or beneficial footprint.

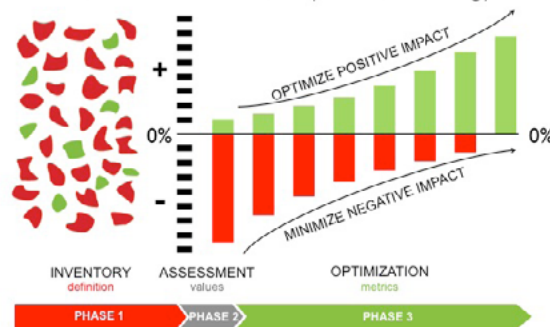


Management theorist Peter Drucker has said that it is a manager’s job to do something the right way (to be efficient), but it is an executive’s job to do the right thing (to be effective).

The Cradle to Cradle approach integrates both eco-effective and eco-efficient approaches in a unique, coherent and positive trajectory.

THE UPCYCLE CHART

Cradle to Cradle® Continuous Improvement Strategy



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McDonough Braungart Design Chemistry’s services and tools are designed to help companies completely understand the nature of their products, improve product design and communicate the benefits of Cradle to Cradle design. Through a multi-step process, MBDC inventories products, assesses their safety to humans and the environment, and develops optimization strategies for improvement.

ORGANIZATIONAL SERVICES

MBDC developed the unique set of **Cradle to Cradle®** values and principles that has been used in industry for 17 years to spur innovation, differentiate businesses, and benefit people and the planet. The Cradle to Cradle® principles provide the basis for developing industry leadership and improving product quality. We provide companies with various ways to understand and implement Cradle to Cradle design.



CREATE A BENEFICIAL FOOTPRINT

Doing **less bad** is not the same as doing **more good**. Go beyond minimizing your negative footprint and strive towards creating a beneficial footprint.

MBDC can inventory, assess, and optimize your company's strategy and operations in order to move towards the goal of a wholly positive impact on people and the planet.

Cradle to Cradle® Company Benchmarking

Get a snapshot of your company's sustainability profile from a Cradle to Cradle® perspective and receive high level recommendations for optimizing the company's products, operations, and strategy.

Cradle to Cradle® Enterprise Roadmaps

We partner with corporate enterprises to map out a long-term, positive vision and eco-effective strategies for your enterprise, brand or product that are aligned with Cradle to Cradle principles. MBDC will provide consultation and support to innovate solutions, meet targets, and achieve continuous improvement towards your goals.

Cradle to Cradle® Communications

MBDC can help develop messaging campaigns and communication materials that express the positive, hopeful mindset of the Cradle to Cradle philosophy and articulate the benefits of the strategies and achievements. MBDC can also provide trainings to staff, supply chain partners, and stakeholders to facilitate internal communications and adoption of Cradle to Cradle strategies.

PRODUCT SERVICES

MBDC shares its expertise in Cradle to Cradle® design and material chemistry through product related services that can be offered individually or together in a progression that offers increasing depth of analysis and increasing value to the client.

Cradle to Cradle® Product Screen

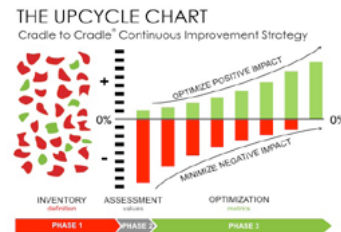
This **Internal Check for Cradle to Cradle Potential** provides quick feedback on the Cradle to Cradle potential of a product based on publicly available information. This screen can provide guidance in selecting and procuring materials for use in products, buildings or office environments. This service can also help manufacturers gauge a product's fit for certification or other product services.

Cradle to Cradle® Product Inventory & Assessment

MBDC conducts a thorough evaluation of product impacts to humans and the environment using data collected from the manufacturer and throughout the supply chain. This in-depth process helps manufacturers identify hazards throughout the product lifecycle and identify priorities for improving the eco-effectiveness of a product.

Cradle to Cradle® Product Optimization

MBDC will analyze the results of the Product Inventory and Assessment and partner with you to improve product design and manufacturing operations to minimize negative impacts, optimize positive impacts, and work towards the goal of 100% good for people, planet, and profits.



For any new or existing product or packaging design, MBDC can help you rethink and redesign using the Cradle to Cradle framework, select optimal materials, and plan for the future use cycles for the component materials.

Cradle to Cradle Certified^{CM} Program for Products

A product that is inventoried, assessed, and optimized for eco-effectiveness can be Cradle to Cradle Certified^{CM}. MBDC is a leading service provider for and originator of the program, which is now independently managed by the Cradle to Cradle Products Innovation Institute. As an accredited assessor we inventory and assess product data and prepare the product for submission to the Institute for audit and certification.

CRADLE TO CRADLE CERTIFIED^{CM}



The Cradle to Cradle Certified^{CM} Program is a multi-attribute and multi-level certification that acknowledges continuous improvement towards the goal of a product that is wholly beneficial for people and the planet. The certification program is based on the Cradle to Cradle[®] framework and methodology, which has been developed and implemented by McDonough Braungart Design Chemistry (MBDC) over the past two decades.

MBDC created the certification program in 2005 to recognize achievement in applying these principles. In 2010, MBDC gifted the Cradle to Cradle Products Innovation Institute with an exclusive license for the certification program and methodology, and the Institute now administers the program and manages the product standard as a third-party, nonprofit organization.

As the originator of the Cradle to Cradle Certified^{CM} program and assessment methodology, MBDC has the most experience in working throughout the supply chain to collect formulations, evaluating product and manufacturing data to meet the requirements, and supporting clients through the process. In addition, we can offer Cradle to Cradle[®] consulting services to help you solve sustainability challenges and optimize your product to higher levels.

The Cradle to Cradle Products Innovation Institute is a non-profit organization, co-founded by William McDonough and Michael Braungart, created to bring about a large scale transformation in the way we make things. The Institute's mission is to provide a standard to guide product manufacturers and designers in making safe and healthy things for our world.



The Cradle to Cradle Certified^{CM} Product Standard is managed and updated by the Institute's Certification Standards Board. Unlike single-attribute eco-labels, the Cradle to Cradle Certified^{CM} product standard takes a comprehensive approach to evaluating the design of a product and the practices employed in manufacturing the product.

The materials and manufacturing processes of each product are assessed in five categories: **material health, material reutilization, renewable energy & carbon management, water stewardship, and social fairness.** Products that meet the the standard will be Cradle to Cradle Certified^{CM} at one of five levels (**Basic, Bronze, Silver, Gold or Platinum**).

MATERIAL HEALTH CASE STUDY

EXECUTIVE VISION

Committing to healthy chemistry has become the guiding principle for material selection and product design for Construction Specialties (C/S). MBDC works with C/S and its suppliers to inventory, assess, and optimize product lines. C/S is implementing a Cradle to Cradle® Optimization strategy to work towards a wholly positive impact on humans and the environment. Most Acrovyn® 4000 wall protection products have been optimized to eliminate toxicity hazards and have earned the distinction of Cradle to Cradle Certified™ Gold. Seventeen other products are Cradle to Cradle Certified™ Silver.



Value materials as nutrients for safe, continuous cycling.



"Cradle to Cradle allows us to fulfill our corporate vision through this rigorous sustainability protocol that allows us to create products that make buildings better."

Howard Williams, LEED AP, ID+C
Construction Specialties
Vice President & General Manager

MANAGEMENT STRATEGY

Develop a plan to design products and optimize ingredients to safely, continuously reuse materials as nutrients.

Assess the impacts of existing materials and process to human and environmental health.

Identify ingredients to optimize and work with suppliers to reformulate them.

Where hazardous ingredients cannot be replaced immediately, ensure they are safely managed, while continuing to innovate for optimization.

Select ingredients that are 'biological nutrients' which can be safely recovered and either reused or composted to improve soil health.

Select ingredients that are 'technical nutrients' which can be safely returned and reused in new products.

MATERIAL REUTILIZATION CASE STUDY

EXECUTIVE VISION

Shaw Industries applied Cradle to Cradle® principles in the design of PVC-free commercial carpet tiles that are separable into component materials for carpet-to-carpet recycling. Each tile is labeled with a toll-free number that nationwide customers can call to have used tiles picked up for recycling. Shaw worked with MBDC to assess the human and environmental health attributes of all ingredients and identify preferred substitutes. Currently 55% of the company's \$4 billion of total sales comes from Cradle to Cradle Certified™ products, including residential and commercial carpet, carpet tile, and hardwood flooring.



Maintain continuous flows of biological and technical nutrients.



"Product sustainability starts by designing with the end in mind. At Shaw, we begin with the most environmentally and socially responsible ingredient materials and then make sure our products can remain in a continuous cycle of use and reuse. Cradle to Cradle helps us ensure we are using innovative, responsible design to create a better future for our people and our planet."

Paul Murray
Shaw Industries, Inc.
Vice President
Sustainability & Environmental Affairs

MANAGEMENT STRATEGY

Create a plan to recover used products and safely and continuously reuse materials as biological or technical nutrients.

Design products so that biological and technical nutrients can be easily disassembled and separated for recycling or composting.

Create and support systems to educate customers, recover products from them after the use phase is done, and safely direct the flow of all component materials for the next life cycle.

Design products with the next lifecycle in mind using only biological nutrients that can build healthy soil and reclaimed technical nutrients that can be separated and reused again safely.

RENEWABLE ENERGY CASE STUDY

EXECUTIVE VISION

Companies in the office furniture industry—from early adopters Herman Miller and Steelcase to other brands such as Allsteel and Keilhauer—use the Cradle to Cradle® framework to define and improve their sustainability footprint. Herman Miller applied savings gained from energy efficiency measures towards renewable energy certificates and purchase agreements with energy generators to achieve 100% renewable energy for its worldwide operations. Steelcase is the sole sponsor of a wind farm in Texas producing 35 million kWh of clean electricity each year—the largest wind investment in the furniture industry.



*Power all operations with
100% renewable energy.*

Steelcase

“Our commitment to the Wege Wind Energy Farm and powering our operations with 100% renewable energy is a complement to our on-going efforts to reduce our own energy consumption. Steelcase is proud to make the project a reality in what we hope will inspire more companies to invest in green power both nationally and internationally.”

Nancy Hickey
Steelcase
Senior VP

MANAGEMENT STRATEGY

Develop and implement your plan for leveraging energy efficiency to transition to being a renewably powered enterprise.

Collect data on your current mix of electricity sources and your potential for generating renewable energy first on-site, and then nearby or remotely.

Implement energy efficiency projects to reduce energy consumption (demand side management as good business practice).

Identify cost effective renewable energy programs to integrate with production and operations.

Continuously monitor all local and remote opportunities for using renewable energy and begin implementing as soon as cost-effective.

Complete your shift to powering your operations with 100% renewable energy, as costs and infrastructure allow.

WATER STEWARDSHIP CASE STUDY

EXECUTIVE VISION

MBDC has assisted various clients with efforts to optimize water stewardship. Our first client, Designtex (a Steelcase company), successfully eliminated hazardous ingredients from textile manufacturing and the effluent now sustains water quality rather than degrades it. Similarly, cleaning products company Method uses the Cradle to Cradle® framework to evaluate and optimize ingredients to be as safe as possible for use in the home and in water systems, and all product ingredients are disclosed to the public. Method's laundry detergent (one of their 60+ Cradle to Cradle Certified™ formulations) is designed to contain significantly less water in the bottle (eco-efficiency) and is being optimized for human and environmental health (eco-effectiveness).



Regard water as a precious resource.

method[™]

"Obtaining external verification from MBDC, the people who wrote the book on Cradle to Cradle® design, reinforces the work we're doing to make our products safe for people and the environment, and it reflects our authentic mission of sustainability at a time when many companies talk about being green."

Adam Lowry
Method
Cofounder

MANAGEMENT STRATEGY

Define a trajectory from signaling your intention to optimize water quality efficiency, to achieve that goal.

Adopt a set of principles to guide your efforts in protecting and enhancing water quality.

Conduct a water audit of your facilities, to characterize current water sources, discharges and impacts.

Implement process improvements to enhance effluent water quality and/or reduce water consumption, and monitor performance over time.

Demonstrate water stewardship throughout your facilities and products by achieving safe reuse flows, promoting healthy ecosystems and addressing local impacts.

SOCIAL FAIRNESS CASE STUDY

EXECUTIVE VISION

IceStone has integrated the Cradle to Cradle® framework throughout its products and operations to show leadership in social and environmental responsibility, promote green-collar jobs, and support the green building industry. Within IceStone's repurposed and day-lit facility in Brooklyn, NY, 100% of wastewater is recycled and 50% of manufacturing energy is offset with renewable energy credits. IceStone believes that all employees are partners in the company who receive living wages, health benefits, and job training. IceStone has completed a third-party social audit by Verite and is a founding certified B Corporation.



Celebrate all people and natural systems.

IceStone®

"Identifying a third-party certification that considered all aspects of IceStone's operations was imperative. Any company can design products with recycled content and off-set their energy use with carbon credits, but the difference is how those companies treat their employees and the impact those companies have on the local and global community. MBDC is a trusted resource for IceStone, and has helped our team create the safest and most sustainable surfaces possible."

Dal LaMagna
IceStone LLC
CEO & President

MANAGEMENT STRATEGY

Develop a process and timeline to realize your organization's social fairness vision.

Exceed and lead in the creation of standards for health, safety, ethical performance, and social fairness.

Engage internal and external stakeholders through open communication that integrates their creativity, ideas and feedback.

Obtain third-party accreditation for social fairness practices in your enterprise.

Partner with communities and regions within which you operate, as well as interest groups focused on broader issues.

Demonstrate leadership by honoring employees, customers, communities and ecosystems, and reporting publicly and transparently on your ongoing achievements and challenges.

LEADING COMPANIES TOWARD **SUSTAINABLE GROWTH**

McDONOUGH BRAUNGART DESIGN CHEMISTRY (MBDC)

CRADLE TO CRADLE® SCIENCE, INNOVATION + LEADERSHIP

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