



cradle to cradle

Designers work to reconcile the demand for **totally recyclable design** with the means required to achieve it.

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in their influential 2002 book, *Cradle to Cradle: Remaking the Way We Make Things*, Architect William McDonough, FAIA, and Chemist Michael Braungart called for design to stop the cycle of use-waste-pollute. The authors suggested that certain products could be reused endlessly to make similar products (cradle to cradle), rather than recycled into lower-grade products until the last stop is a landfill (cradle to grave).

Three years later, it behooves designers to reflect on whether the notion of cradle to cradle is still a viable one, and if so, whether the industry has made any progress toward achieving it. Such an examination is especially relevant in a time when mass sentiment is demanding totally green design, and the government, public and design industry are wrestling with the decision to either commit to the long haul – or abandon it all together.

THE SPECTRUM OF ENVIRONMENTALLY CONSCIOUS DESIGN

Green product design may indicate recyclability, but more typically it's preventive, using fewer resources and safer materials and methods. Cradle-to-cradle design, by contrast, might be described as extreme recycling that presumes the use of fewer and safer resources from the beginning. McDonough Braungart Design Chemistry (MBDC), the Virginia-based product and process design firm founded by McDonough and Braungart in 1995, defines cradle-to-cradle design on its Web site as follows: "The new paradigm proposes that human design can learn from nature to be effective, safe, enriching and delightful. Cradle-to-cradle design models human industry on nature's processes, in which materials are viewed as nutrients circulating in healthy, safe metabolisms. Industry must protect and

enrich ecosystems – nature's 'biological metabolism' – while also maintaining safe, productive 'technical metabolism' for the high-quality use and circulation of mineral, synthetic and other materials."

While cradle-to-cradle design focuses on materials, sustainable design currently relies far more on practices. LEED standards are written to limit environmental impact, create a healthful interior environment and even improve the outdoor environment – as in the case of green roofs and reused brownfields – but they do not require that materials be recyclable cradle-to-cradle.

Even in the best-practices list compiled for the Chicago Center for Green Technology – a model green building and a lab for developers of green practices – the concept of cradle-to-cradle recycling is not addressed. The list specifies that materials be replenishable as quickly as they are consumed. It calls for manufacturers to take back used carpeting and ceiling tiles and recycle them, but it doesn't specify the extent of recycling. The list also specifies that designers "reduce the need to produce more products." Cradle-to-cradle design requires the development of new materials and therefore, more products.

FEASIBILITY

There are several products on the market that serve as living proof of cradle to cradle's feasibility. The carpet industry is the vanguard, led by such examples as Shaw Industries' *Eco Solution Q*® carpet, developed with MBDC. Shaw promotes it as containing 25-percent recycled content and being completely recyclable into new carpet. Shaw also promises to pick up and recycle its carpeting.

Following the path of carpet are textiles, the industry responsible for Victor Innovatex's *Eco-Intelligent*® polyester. This material is made

three bringing green into the future



Nellie Reid, LEED AP Associate, Gensler

Reid became Gensler's first LEED-accredited professional in 2001, just a few years after graduating from architecture school. As the California-based regional leader of Gensler's sustainable design task force, Reid applies green practices across all types of projects. She has persuaded many clients to adopt green technologies by seeing through their eyes. Moreover, Reid reminds clients that building greener doesn't always mean they need to pursue a LEED rating, because

"There are many shades of green."

Reid sees "a big shift in thinking" as developers realize that green design is economically viable, marketable to tenants, good for the community and good for their image. Furniture and carpet makers are following suit. "The great thing about these companies — like Herman Miller and Knoll — is that they look beyond green in the product to green in their corporate philosophy," Reid says.



Robin Guenther, AIA Principal, Guenther 5 Architects

Guenther has specialized in healthcare facilities for 25 years and has worked at her New York-based firm for 15 years. Thousands have downloaded her "Green Guide for Health Care," a best-practices guide for hospitals, since it was posted in November at www.gghc.org. Kaiser Permanente and other healthcare organizations plan to use the guide in a pilot program this year and will discuss their experience in an online forum.

Guenther was drawn to green design in architecture school during the ecology-conscious 1970s. She went to graduate school in London and returned to the United States in 1979 to find that "oil was cheap again; no more ecology movement." She found her true calling while touring hospitals. "I was underwhelmed by the hospitals I visited," she says. "I saw an opportunity to change that environment." She began de-stressing patients by "connecting them with the outdoors" via deeply penetrating sunlight, natural textures and organic forms.




Elaine Aye, IIDA, LEED 2.1 AP Senior Environmental Design Consultant, Green Building Services

Aye has always been one to live her life according to environmentally sustainable practices. But it wasn't until seven years ago that she realized her nearly 20-year career as an interior designer wasn't necessarily living up to the green standards she had set in her personal life. "It occurred to me that there were things I could be doing, in terms of wasting less, using resources wisely and being more conscious of my material selections," Aye says.

At the recommendation of a friend, Aye attended a sustainable design course at the Northwest Earth Institute. Led by green pioneers Jeanne and Dick Roy, it was that course that cemented Aye's dedication to sustainable design. Today Aye serves as a Senior Design Consultant, guiding projects seeking LEED certification and overall green building design at Portland, Ore.'s Green Building Services, where she works to convey the benefits of environmentally responsible design to various design teams and companies. "It's not always an easy sell," she says. "You need to justify it with financial cost analyses, human factor benefits and improved work flow processes."

Challenges aside, Aye is seeing evidence of progress. Her SPACES: Designing Work Environments event, launched in 2003 as a way to inspire, educate and demonstrate to interior designers, architects and facility managers the potential of green design, drew over 200 attendees at its inaugural event and will be repeated in 2005. For more information on the event, visit www.iida-or.org.





“Cradle to cradle design models human industry on nature’s processes, in which materials are viewed as nutrients circulating in healthy, safe metabolisms.” —MBDC

without known carcinogens, chlorine or hazardous dyes and is said to be perpetually recyclable. MBDC rated it at level four (out of five) for eco-effectiveness.

Makers of office furniture, too, are demonstrating a visible effort toward total recyclability with products like Herman Miller’s *Mira* office chair. This product won an award from the Industrial Designers Society of America for both its ergonomics and its sustainability. It can be recycled into an equivalent chair and is designed to be disassembled easily.

But for every living example of cradle to cradle, there are thousands that fall short. “What holds cradle to cradle back from being carried out in a pure sense is the lack of technology and infrastructure to recycle all the products we currently use today back into the same product after their useful life,” says Ken Wilson, IIDA, AIA, LEED AP, IIDA’s Sustainable Design Advisor and *Contract Magazine*’s Designer of the Year.

Indeed, even McDonough and Braungart’s pinnacle prototype lacks the technology to support it. To demonstrate the practicality of their book’s concept, the authors printed the book on a paper-like plastic that can be recycled without losing quality “in localities with systems to collect polypropylene.” Yet polypropylene is categorized as type 5 in the plastics recycling code. Most recycling facilities process only types 1 and 2 as a matter of cost-effectiveness. In order for cradle to cradle to be considered a practical way of life, polypropylene would first need to find a cheaper way back to the factory.

COLLECTIVE RESPONSIBILITY

But who is responsible for finding that cheaper path? Given that industry is humankind’s manipulation of nature, it’s a heady challenge to model industry *on* nature. As McDonough and Braungart have stated often, cradle-to-cradle design requires a second Industrial Revolution. Like the first one, this revolution could take decades of work by millions of people led by visionaries with the support of governments and capital. “I see the cradle-to-cradle philosophy as more of a goal – something for all of us to set our sights on,” Wilson says.

Whether speaking of cradle-to-cradle or the larger green umbrella, the responsibility lies primarily in the hands of designers and engineers who write building specifications, because buildings use even more resources than industry or transportation. The U.S. Green Building Council (USGBC) estimates that buildings account for 36 percent of all energy use, including 65 percent of electricity. Buildings also account for 30 percent of greenhouse gas emissions, raw materials use and waste.

But according to a November 2004 survey by *Building Design & Construction* magazine, the U.S. building industry is still largely ambivalent about green design. Nearly all 498 design and construction professionals responding said they saw the green-building movement growing. However, more than 40 percent said sustainable design was believed to increase initial costs substantially – and



that the market was unwilling to pay. More than 50 percent reported that clients had rejected green design because they weren't interested and it wasn't required.


"If they're not interested, they probably don't know enough about it yet. They might think a green project has to look like something out of *Natural Home*," Wilson says. Wilson's Envision Design designed the Washington, D.C., offices of Greenpeace and Environmental Defense. "User-owners have been more receptive than developers. Developers want to sell the building. Government agencies, universities and other user-owners build to stay indefinitely."

Admittedly, even a little green is better than none. Nellie Reid, AIA, LEED AP, of Gensler's Santa Monica, Calif., office, says energy and water efficiency are popular because developers see the payback in three to five years, depending on local utility rates. Materials are

another small-scale way to green. "Materials are an expense, not a payback, but if demand for green materials increases due to LEED, the materials become cheaper," Reid says.

"Gensler asks manufacturers about recycled content, low-emitting materials and how the furniture is manufactured so that they eventually may make the products."

The viability of environmentally sound design of any type or level might be measured in part by the tenacity of architects and designers who learn about it and specify it. About 20,000 industry professionals have verified their knowledge by passing the LEED accreditation exam. Wilson says that interest is growing rapidly.

Gradually, designers and architects are supplying the education and patience for sustainability. Those responsible for construction will have to supply the money, and those in government may have to determine how much time it will take. 

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ADAPTED AS AN EXERCISE BY HEATHER JAKUSZ, DIRECTOR OF EDUCATION AND PROFESSIONAL DEVELOPMENT

exercise:

- 1) Name three products or items that would be ideal examples of cradle-to-cradle design.
- 2) What do you believe to be the best way to incorporate cradle-to-cradle theory with sustainable practice?
- 3) Name one way in which you can start to utilize cradle-to-cradle practice in your career.
- 4) What steps must be taken to make LEED a more valuable commodity in the design community?
- 5) Name two or three incentives that could be offered to those companies that make cradle-to-cradle ideals and sustainability a priority.

instructions:

Individuals who read this article and complete the series of questions above are eligible to receive continuing education credit (CEUs), as approved by IIDA. Completed exercises should be returned to IIDA via:

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There is a \$12 NCIDQ registration fee to register and obtain CEU credit.

This course has been approved for 1 hour of continuing education credit (0.1 CEU). Upon returning a completed exercise to IIDA, registration information will be forwarded to you. If you have any questions, contact the IIDA Education Department at 312.467.1950 or toll-free at 888.799.IIDA.

sources

Look to these resources for more on the trends, products and information related to cradle-to-cradle and green design:

Cradle to Cradle: Remaking the Way We Make Things — by William McDonough and Michael Braungart (2002, North Point Press).

U. S. Green Building Council — www.usgbc.org.

IIDA's Green Track — www.iida.org.

Environ Design 9 — April 21, 2005 in New York City. Authors McDonough and Braungart speak on the emerging opportunities for a cradle-to-cradle economy in Europe and China. For more information, visit www.isdesignet.com.

"Green Guide for Health Care" — A best-practices guide for hospitals. Available at www.gghc.org.