



A DEEPER SHADE OF GREEN

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ADD IT UP!

According to the WorldWatch Institute Report, buildings are responsible for:

- 65.2% of total U.S. electricity consumption
 - 40% of total primary energy use
- 30% of total U.S. greenhouse gas emissions
- 136 million tons of construction and demolition waste in the U.S. (approx. 2.8 lbs./person/day)
 - 16% of drinkable water
- 40% (3 billion tons annually) of raw materials used globally
 - 20% of waste sent to landfills
- 14,000 square-foot building = 7 tons of debris

Thirty-five years after the first Earth Day, environmentalism doesn't look the same.

"People will always need buildings, and the next generation wants them green. By far the most talked-about topic in the architecture universe is how to reduce the environmental impact of everything from summer cottages to skyscrapers."

Says who?

The quote isn't pulled from an environmental group. It's not from the pages of a design trade publication. It's the start of an article in the Jan. 31, 2005 edition of one of business' most traditional mainstays, *The Wall Street Journal*.

CLEARLY, "TREE-HUGGING" HAS GONE MAINSTREAM.

The first Earth Day was 35 years ago, and the quest for environmental progress has been evolving rapidly ever since.

When it comes to issues affecting the places where people work, the signals of change are everywhere -- Greenguard, LEED, requests from customers for environmental information in proposals, frequent articles in all the major trade and business media. And, not to be overlooked, green marketing efforts are sprouting all over the landscape. No wonder. As the environmental movement percolates through more and more layers of society, it

presents the potential of solid advantage for businesses of all kinds.

In the past, most industries and businesses focused their efforts primarily on preventing or minimizing pollution in production. Today, the focus is broadening to include every stage of a product's life - from materials extraction to end-of-use and every stage in-between.

For long-time environmentalists, life cycle thinking - thinking through a product's environmental impact through all stages of its life - is a natural evolution. As John Muir, founder of the Sierra Club, observed almost 100 years ago, "When we try to pick out anything by itself, we find it hitched to everything else in the Universe."

But within the world of business, life cycle thinking is no less than a 21st century revolution with stakes that are high. At the vanguard are progressive companies that regard environmentalism as an important part of their business strategy. They're investing resources to help make sure their impacts are positive, and they're offering their customers the choice of products and services that promise to do little or no harm - to the environment and human health.

Through life cycle thinking, diverse companies -- Steelcase Inc., Noikia, Hewlett-Packard, IBM, Ford, 3M and BASF, to name just a few -- are driving a higher level of environmentalism within their industries through life cycle assessment -- a specific method for systematically identifying, quantifying and assessing sources of environmental impacts throughout a product's life cycle.

A photograph of a tall skyscraper, likely the Freedom Tower, against a hazy, orange-tinted sky. A large white magnifying glass is superimposed over the top of the building, focusing on the upper section. The text is overlaid on the lower part of the image.

"The building and furnishings industry accounts for significant levels of energy consumption and waste production. As a member of the that industry, I believe we need to develop a new way of thinking and approach how we design products differently." Allan Smith, director of Communications and Environmental Strategy, Steelcase Inc.

Doing It

For the most part, talking green comes easy. There's a ton of environmental information out there today. The problem is that much of it is conflicting or unclear, and some of it's downright misleading or derisive.

Taking things beyond talk is harder - much harder. Economics, corporate values, competition, relationships with suppliers and customer loyalty are just some of the complexities that can come into play.

Life cycle assessment is a way to sort through "green-wash" and unsubstantiated marketing claims. It provides a framework for asking questions, assessing information and making choices so you can effectively incorporate environmental thinking into design solutions.

Steelcase's approach embraces five phases: the materials that are used, production methods, transportation, use and end-of use.

Here's information about each phase, plus suggestions for what to ask about when you're trying to select products that are as green as they get -- with the lowest possible environmental impact in every phase.

1. Materials phase

During this first stage in a product's life cycle, parts and raw materials are procured.

This almost always involves extracting and converting natural resources. For example, before steel production, iron ore has to be extracted. Producing most plastics requires crude oil.

To help lower the environmental impact ...

- Choose products made with lower energy-impact materials. For example, it takes more energy to make aluminum than steel.
- Choose products made from materials that are rapidly renewable without significant environmental impact – bamboo, wheatboard and cotton are a few examples.
- Choose wood products that come from sustainable forests or farms, which will continue to grow timber through managed harvesting or replanting.
- Choose materials made from recycled content and/or those that can be easily and efficiently recycled.
- Avoid materials that off-gas or contain known or suspected carcinogens.

Some manufacturers, including Steelcase, are studying the potential environmental impacts of the materials being used to create their products – not just raw chemicals, but also what’s formed when chemicals interact.

The goal is to eliminate use of known:

- Carcinogens
- Mutagens (substances which cause an increase in the rate of change in genes that can lead to defective cells or cancer)
- Teratogens (an agent that can cause malformations of an embryo or fetus)
- Bioaccumulatives (substances that do not break down over time)
- Endocrine disrupters (substances that disrupt normal endocrine function)

To help in the effort, Steelcase has entered into an agreement with McDonough Braungart Design Chemistry (MBDC) to conduct a material assessment of the top 10 materials used in Steelcase products. By benchmarking products using MBDC’s cradle-to-cradle criteria, Steelcase aims to eliminate waste and optimize products and processes so that the materials used are healthy for humans and the environment. Additionally, the new processes will be used to develop products that can be perpetually recovered and reused.

WHAT IN THE WORLD?

IN THE LAST 50 YEARS:

- The world’s population has doubled, from 3 to 6 billion people.
- More than 70 million people are being added to the planet each year.
- Global energy consumption has increased fourfold, outpacing the rate of population growth.
- The world’s economy has quintupled.

SINCE THE BEGINNING OF THE INDUSTRIAL REVOLUTION:

- Carbon dioxide concentrations have increased nearly 30%.
- Methane concentrations have more than doubled.
- Nitrous oxide concentrations have risen by about 15%.
- Acid rain – the result of burning fossil fuels to generate electricity – is damaging forests and lakes, freshwater and coastal ecosystems, soil and historical buildings and monuments.
- Eutrophication -- the aging of lakes through algae growth – is dramatically accelerating around the world because of fertilizer run-off and other pollutants, killing plants and animals and contaminating shorelines.
- Ozone gas is building within the lower levels of our atmosphere as car and industry emissions react with oxygen in sunlight, causing respiratory problems in people and damage to plants, plastics, cloth, painted surfaces, etc.
- Abiotic (non-living) natural resources, including fossil fuels and metal ores such as iron and copper, are being depleted at accelerating rates.
- The amount of waste entering landfills has been exponentially increasing due to population growth and the cultural mindset that it’s cheaper to replace than repair.
- Chemical pollutants are affecting species throughout the food chain.

2. Production phase

This phase is all about manufacturing -- making products from raw materials using specific processes. It includes from the time the raw materials enter the plant until the product is ready for packaging. It involves machines and the energy to run them, and may include chemical and thermal processing, assembly and finishing.

To help lower the environmental impact ...

- Use environmentally friendly materials to reduce emissions.
- Use energy-efficient technologies in production.
- Use alternate energy sources when possible.

“As designers and manufacturers in the buildings industry, we need to understand that every action we take -- what materials we choose, what equipment we use, what supplies we purchase, etc. -- each one of these actions are choices that we control. ”

3. Transportation phase

Whether by road, rail, sea or air -- after it's manufactured, the product has to be transported to where it will be used. And that means packaging, energy consumption and emissions. How much is more variable than you might think.

To help lower the environmental impact ...

- Leverage the load potential throughout the entire transport route -- avoid having a trailer filled with nothing but air traveling down the road.
- Load trucks efficiently.
- Look for ways to minimize or eliminate packaging, or consider reusable containers.
- Look for suppliers in close proximity or choose those that use the most efficient form of transportation.

4. Use Phase

This is usually the longest phase of a product's life. It's out of the manufacturer's hands and into the customer's. Depending on what the product is, additional energy and materials may be consumed. Emissions and waste may be generated. Maintenance or repair may be options to prolong the useful life of the product or improve it.

To help lower the environmental impact ...

- Design product so it contributes to efficient energy use in other areas - e.g., improved ventilation.
- Select materials that won't negatively affect indoor air quality.

5. End-of-use phase

Is a landfill or incineration the only option? Or can the used product become a resource through reuse or recycling? Product recyclability is a criterion more people are looking for and more companies are claiming. But not all claims mean the same thing. A manufacturer may claim that a product has a high percentage of recyclability, but if it takes eight hours or more to disassemble so it can be recycled, it probably will never achieve its claim.

So designing with ease of disassembly is a critical factor for recycling product at end-of-use.

To help lower the environmental impact ...

- Choose quality products that can stand up to use.
- Choose products that can be easily repaired, refreshed or upgraded.
- Choose products designed for disassembly and recyclability.
- Choose products that were designed with an end-of-use strategy in mind.

“There's increasing demand for quantified information about environmental performance of products and services,” says David Rinard, Steelcase's director of Environmental Performance.

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