Focus on Green
Plantable
Packaging
Reporting on Sustainability
Eco-Friendly Architecture
Interface's Chairman
Ray C. Anderson
On Sustainable Design
Chairman Ray C. Anderson talks about how the adoption of sustainability measures at Interface has led to innovative new products, reduced costs, increased sales and improved profits.

Pangea Organics
Body and skincare products maker Pangea Organics "thinks outside the landfill" to ensure their products, packaging and operating processes are eco-friendly.

Design for Life
Before designing its new Zody task chair, Haworth designers and engineers eliminated any materials and chemicals that would be potentially harmful to environmental and human health.

Quiz:
Environmental Logos
You see these logos proudly displayed on packaging, brochures and advertisements, but what do they stand for? Test your environmental IQ by matching these logos with the organizations they represent.

The World's
Greenest Museum
The California Academy of Sciences in San Francisco's Golden Gate Park is a natural science museum for the 21st century. With a living roof and solar cell canopies, its architecture presents a lesson in living in harmony with nature.
Interface Chairman Ray C. Anderson on Sustainable Design

Interface Chairman Ray C. Anderson has worked tirelessly to promote environmental sustainability among corporations. Here he tells Peter Lawrence, chairman of Corporate Design Foundation, how Interface uses design to eliminate emissions and waste.

I’ve heard you described as the ‘greenest CEO in America.’ You are certainly one of the most passionate, vocal and proactive. Were you always like this?

No. When I founded Interface in 1973, I just wanted to survive. As a company, we certainly complied with the law and obeyed regulations, but beyond that I never gave a thought to what we were doing to the earth. Traditionally, carpet manufacturing has been a petroleum-based business. Back then, our factories, as others in our industry, spewed out hundreds of gallons of toxic wastewater and more than 900 different pollutants.

What changed your thinking on sustainability?

In the mid-1990s, customers were asking our sales force about our environmental stance. Our research division organized an environmental task force, and asked me to give the kickoff speech and share my environmental vision. Frankly, I didn’t have a vision, except comply, comply, comply. Through pure serendipity, someone sent me a copy of Paul Hawken’s book The Ecology of Commerce. It changed my life. Hawken’s premise was that industrialists are largely responsible for the destruction of the earth and are the only ones powerful enough to stop it. It was an epiphanal moment. Though we were very successful in a conventional sense, I was dumbfounded by the impact of the industrial system on the environment. A new definition of success flooded my consciousness. I was a plunderer of the earth, and this was not a legacy that I wanted to leave behind.

What does sustainability mean to Interface?

It means operating in such a way that we take from the earth only that which is naturally and rapidly renewable—not another fresh drop of oil—and do zero harm to the biosphere.

What did you tell your task force back in 1994?

I gave them a mission to convert Interface to a restorative enterprise. We evolved that into a strategy for ‘Climbing Mount Sustainability’—reduce, reuse, reclaim, recycle (later we added redesign), adopt best business practices and then advance and share them, develop sustainable technologies and invest in them when it makes economic sense, and challenge our suppliers to follow our lead.
The Interview

What kind of progress have you made over the last 14 years?
We’re quite a way up the mountain on all fronts. From our 1996 baseline, we have reduced waste by about 52%. That has generated in real dollars, $372 million of cost avoidance. We have reduced our net greenhouse gases in absolute tonnage by 88%. Water usage worldwide in our company is down 79%. We have been able to close 47% of our smokestacks with process changes four-year-long industry-wide recession when our primary market actually shrunk 36%. Has your sustainability emphasis changed the way Interface designs its products?
Completely. To eliminate waste, we saw that we had to design our products in a different way. Today the average product in our factory contains 16% less nylon than 10 years ago. All perform extremely well, and the offset created upstream in our suppliers’ factories is equivalent to 10 years of nega- (not used) energy.

“One of your best-selling tile carpets is Entropy®. Could you tell me how that came about?”
One day our head designer, David Oakley, challenged his design team to go into the forest and see how nature would design a floor covering. He told them, don’t come back with leaf designs; come back with nature’s design principles. The team spent a day literally looking at the forest floor, the ground, the streambeds, and finally it dawned on them, ‘There are no two things alike here.’ No two sticks, no two stones, no two leaves, anything. Yet there’s a pleasant orderliness in this chaos. When they came back, they designed a carpet tile such that no two tiles were identical but different. Entropy has sold faster than any other Interface product. Today there are some 82 products designed on Entropy principles, representing over 40% of our carpet tile sales.

What’s the environmental advantage?
There is very little off-qualities in production; inspectors cannot find defects among this deliberate imperfection of no two alike. There is also very little waste in the installation. Installers can install quickly because they don’t have to worry about getting the tile running in the same direction, the more random the better. There is also very little scrap because even the piece tiles can find a place in installation. The user can actually replace an individual tile that gets damaged by a spill, or whatever, and the new tile won’t stick out like a sore thumb. Users can even rotate tiles to equalize wear.

How did Interface come up with the world’s first totally glue-free carpet tile?
We took this on because glue is a source of volatile organic compounds (VOC) that contribute to poor indoor air quality. In discussions about how to get rid of glue in the installation of carpet tiles, we wrestled with van der Waals’ molecular attraction question: How does a gecko cling upside down to the ceiling? Our designers didn’t find that answer but they did come up with a revolutionary 2.5″ x 2.5″ releasable adhesive tape for the four corners of the backside of each tile. When the tiles are connected laterally, gravity keeps the tiles securely on the floor and completely eliminates the need for glue in the installation. Getting rid of the glue has reduced environmental impact by over 90%.

Were there financial savings as well? Absolutely. Not only for us but for the installers who can quickly place and move the tiles without worrying about the glue underneath. Interface’s sustainability initiatives extend to everything from recyclable swath samples to a tufting method that reduces the amount of nylon in every carpet. Now there is “Climate Neutral, Cool Carpet.” Can you talk about that?
This is a development aimed at customers who are particularly concerned about greenhouse gas (GHG) emissions. It enables customers to buy a Cool Carpet™ product that we will certify as climate neutral throughout its life cycle. We do that by offsetting, or balancing, net emissions from wellhead through reclamation—raw material acquisition, manufacturing, transport, use and maintenance, disposal or recycling. Since 2003, we have sold more than 52 million square yards of climate neutral carpet.

Do you consider Interface a sustainable company today?
No. There’s not a sustainable company or sustainable product anywhere on earth yet, but we’re working on it and making terrific progress.

What is your hope and vision for the future?
We look forward to the day when our factories have no smokestacks and no effluents. If successful, we’ll spend the rest of our days harvesting yesterday’s carpets, recycling old petrochemicals into new materials, and converting sunlight into energy. There will be zero scrap going into landfills and zero emissions into the biosphere. Literally, our company will grow by cleaning up the world, not by polluting or degrading it. We’ll be doing well by doing good. That’s the vision.

“...Our head designer challenged his team to go into the forest and see how nature would design a floor... It dawned on them, ‘there are no two things alike,’ yet there’s a pleasant orderliness... They designed a product where no two carpet tiles were identical, similar but different.”

and 81% of our effluent pipes. We have recaptured used product at the end of its first life to the tune of 127 million pounds of stuff that we have brought back to our factories to close the loop on material flow. Six of our 11 factories are now run on 100% renewable electricity.

Some people would ask, “What did such reductions cost?”
The answer is: It did not cost; it paid. Our cost is down, not up. Waste elimination alone is dispelling the myth that there’s a trade-off between the environment and the economy. Since we started the program, Interface also has grown by two-thirds in sales, and profits have doubled. We expanded and survived a

This dematerializing through conscious design reaches back into the supply chain all the way to the wellhead.

Another example is that for years our industry has wet-printed patterns onto a plain-colored carpet base—a water-and energy-intensive process that also requires chemical treatment of wash water before release into the waterways. Our engineers discovered that the tufting machine that forms the pile face of the carpet has the potential to precisely place tufts of yarn of selected colors to form quite intricate patterns. So we abandoned wet printing. The result is a family of patented inventions giving us an edge in the marketplace.

Mission Zero Logo
This logo reflects Interface’s mission to become fully sustainable and eliminate its environmental footprint by the year 2020.
Pangea Organics

Restricted to a shoestring budget, IDEO had to choose “off-the-shelf” materials for Pangea Organics’ packaging. But the design result looks anything but off-the-shelf.

Budget constraints, environmental concern, and skincare products so organic that the ingredients list reads like a food label were all factors in Pangea Organics’ choice of packaging design. Not only is the product 100% natural, the packaging is made entirely from post-consumer waste materials and is 100% recyclable or biodegradable.

Joshua Onysko, the 30-year-old founder and CEO of Pangea Organics, would not have it any other way. A man who believes in treading lightly on the earth, Onysko had earlier lived on the beach in Costa Rica, armed with a machete, to chase poachers away from the eggs of endangered green sea turtles. In 1999, at age 21, he bought a one-way ticket to Bombay, first stopping in Rhode Island to spend time with his family. While there, he spotted his mother’s book on making hand-made soap and suggested to her that they give it a try. They created a soap they called “Oatmeal Love,” which he gave to friends and took with him on his travels through India, Nepal, Tibet, Kashmir, and Southeast Asia. He came back to the States two years later determined to disseminate information on sustainable business and living practices by forming an institute he called Pangea, after the super continent that existed before a tectonic cataclysm broke it.
Making of a Brand
To garner Pangea Organics more visibility and respect, IDEO repackaged the products in a way that established a brand identity, communicated the superior all-natural purity of its ingredients, and conveyed its unwavering commitment to protecting the earth.

Recycled Plastic
Pangea liquids are bottled in HDPE 2 recycled plastic. HDPE plastic is commonly used in milk jugs, yogurt cartons, and broth bottles, and is easily recycled.

Opaque Color
To protect light-sensitive ingredients, bottles had to be opaque in color. Brand distinction was created through use of Pangea's signature brown, vibrant accent colors, and FF Din typeface.

Standard Shape
In the bottle industry, this shape is called Boston Round. Readily available, it is offered in a multitude of screw-top closures, including lotion pumps, sprayers, droppers, and flip-top lids.

Botanical Patterns
Line drawings of generic plants added a subtle visual feature to the packaging. The colored ink for the labels lets the pattern underneath show through.

Color Palette
Used on packaging and collateral, each color is meant to delineate the predominant blend of ingredients—e.g., Egyptian Basil & Mint is available as a bar soap, shower gel, and hand and body lotion—not a specific product.

Pangea Logo
A simple leafy stem communicates Pangea's organic philosophy and the botanical origin of its product ingredients.

Educational Inserts
An important part of Pangea Organics' mission is to raise consciousness of the healthful properties of different botanicals and the ecoesthetic uniqueness of its skincare products. Its pamphlet discusses this in detail.

IT DOESN'T JUST SMELL NICE, IT IS NICE.

Editorial Voice
Avoiding the high-minded tone of many natural product messages, IDEO writer Amy Levinthal communicated Pangea's benefits in a friendly and approachable voice.

Glass Jar
The off-the-shelf bottle shape was branded with Pangea's colors and typographic treatment.

Origami Construction
The box for glass jars was designed to be die-cut, scored and assembled without glue. The belly band, printed with soy-based inks in Pangea brown, allowed the company to include an extensive amount of information, which could be easily changed by product or as the need arose without redating the box itself.

Basil Seeds
Pangea Organics' canton is not only totally biodegradable, it is even embedded with basil seeds to encourage people to plant the box rather than toss it into landfill.

Egg Carton Material
Pangea boxes are made out of the same recycled unbleached molded pulp that is typically used for egg cartons and for padding the inside of shipping crates.

Green Dot Logo
The Green Dot logo, commonly used in Europe, communicates that the company has made a financial contribution toward recycling the packaging.

Freshness Symbol
This symbol indicates that Pangea Organics' preservative-free products have a shelf life of 12 months.
apart. To generate funds for his nonprofit cause, he began making soap in beer kegs in his garage and selling the cakes at various farmers' markets.

Onysko made sure that every ingredient came from organically grown plants known for specific medicinal attributes—no petroleum-based ingredients, no synthetic preservatives, and no artificial colors and fragrances. One hundred percent of the ingredients inside were active, unlike many other skincare products that may have just 5% active ingredients.

The public appreciated what they got. With very little marketing, Pangea Organics took in about $100,000 in annual sales.

While contemplating how to make Pangea Organics into a brand that would appeal to major stores, Onysko happened to catch a “Nightline” segment featuring IDEO. Afterwards, Onysko recalls, “I went on IDEO’s website and thought, ‘Oh, they are too big.’ Indeed. One of the world’s premier industrial design firms, IDEO is known for designing the Apple computer mouse and Palm V Pda, among other groundbreaking innovations.

Onysko phoned IDEO anyway, several times in fact, hoping, at least, to arrange a studio tour. He succeeded and managed to tell them about Pangea Organics. As it happened, IDEO was giving more attention to integrating sustainable concepts into their design, and Onysko’s products sparked their interest. IDEO’s graphic designer Ian Groulx and writer Amy Leventhal were assigned to come up with a sustainable packaging design on Pangea’s very limited budget.

Groulx recalls, “Joshua said that his main goal was to get into every Whole Foods in the country. To do this, he knew that he needed to improve his packaging.” The original containers had a decidedly farmers’ market look. “Before the soap was in a chipboard box that had holes in it, but more like bubbles. The label was wrapped around the box,” Groulx says. “The liquids were in plastic bottles, frosted but not opaque.”

On the other hand, Groulx admits, “There weren’t a whole lot of options. In a perfect world, it would be ideal to have someone come in and design the box.” But given the minuscule budget and relatively small quantities needed, “we had to find something that we could get off the shelf.”

Nevertheless, Onysko had a few specific requests. One, the bottle for liquids had to be dark to protect light-sensitive ingredients. Two, the packaging had to be made from post-consumer waste materials and be biodegradable or recyclable later. Three, in keeping with Pangea Organics’ desire to fully disclose ingredients and educate consumers about ecocentric skincare, the packaging surface had to accommodate lots of information.

“We knew what our size was. We knew our target cost. We sort of went from there,” says Groulx. “Aware that custom-shaped bottles were not affordable, Groulx gathered plastic bottle samples from different suppliers. “Joshua was very clear that he wanted us to use No. 1 or No. 2 plastic because those were the only grades that could be recycled into bottles.” Of the silkscreened or printed the product labels in bright contrasting colors like tangerine, fuchsia, baby blue and teal. “The use of contrasting colors was purposeful,” says Groulx. “We explored different colors. Some were too earthy. We wanted to project a sense of fun. We didn’t want it to feel too serious, but serious enough.” The visual effect was instantly contemporary, elegant and in the tradition of natural cosmetic products.

The springlike shades not only helped to soften the masculine impression of brown, but suggest the cosmetic content. The different shades also helped to color-code products by the key ingredients inside.

Although the request was unusual, the manufacturer, UF Technologies, loved the idea, and worked closely with IDEO to produce this novel molded pulp packaging. IDEO initially explored the idea of coloring the boxes chocolate brown, but again quantity and price made it infeasible.

In the end, the box was kept undyed and unbleached, with a paper belly band in Pangea Organics’ signature colors used to convey product information and give the box a colorful shelf presence. The printing, of course, was done by an FSC-certified printer, with soy-based inks.

Using the packaging to educate consumers about ecocentric skincare was as important to Pangea Organics as the way the design looked. Groulx and writer Amy Leventhal worked closely on developing text that complemented the packaging. In reviewing other organic products, they found the “preachy” tone of the copy off-putting. “We came up with the motto: Teach don’t preach,” Groulx says. “We wanted language that was approachable; we didn’t want to make people feel guilty and alienated. Amy did an amazing job telling the right story.”

The finished box is made completely from post-consumer waste fibers and assembled origami-style without glue. And it is 100% compostable and biodegradable. To drive home that point, the box fiber is even embedded with basil seeds, so consumers can soak the box in water and plant it. Onysko explains, “If you aren’t planting your packaging, it is going to landfill, and there’s just too much stuff out there.”

“Thinking outside the landfill” is essential to Onysko. The company aims to extend the useful life of everything it possibly can. Styrofoam and packing peanuts that come in with other shipments are reused. Unused paper from printing operations is purchased from a local printer for repurpose. Pangea Organics’ manufacturing and office facility in Boulder, Colorado, is 100% wind-powered, and the interior is decorated with non-VOC paint and with carpets made from recycled soda bottles.

This ecocentric operating strategy has not hampered growth. Today Pangea Organics produces 41 skincare products, sold in 21 countries, and can be found in such upscale stores as Whole Foods, Wild Oats, and Anthropologie as well as in spas and fitness centers. Its packaging is winning consumers as well as design awards and proving that good design can result even from off-the-shelf materials.
Design for Life

Can a chair look good, feel good and be good for the environment too? Yes, it can. Haworth’s Zody™ task chair has been honored for outstanding design, endorsed by the American Physical Therapy Association, and awarded MBDC’s first Gold Cradle to Cradle™ certification, among other accolades.

When it comes to designing eco-friendly office chairs, Haworth, the world’s fourth largest manufacturer of office furniture, hasn’t been idly sitting around. It has factored sustainability into every step of the process.

“Good design never separates the item and its function from its materials and processes,” says Mark Bonnema, Haworth senior design for environment engineer. “There are always performance, aesthetic, cost and structural requirements. Environmental considerations are one more layer.”

That “layer” was foremost in the development of the award-winning Zody task chair, jointly created by ITO Design in Germany and the Haworth Design Studio, led by Michael Welsh. Collaborating with Haworth engineers, they combined science and design to arrive at a best-in-class sustainable chair that is made of 51% recycled materials and is 98% recyclable at the end of its life span.

Achieving these impressive results demanded a complex analytical process, because what may be safe structurally to the chair’s user may be harmful ecologically, Bonnema explains. “Products can be made from any number of materials and components, each of which has a broad set of environmental impacts over its life cycle, starting with the extraction of raw materials from the ground to how the product is disposed of at the end. Some materials or designs may provide a reduction in one or more impact area, but increase impact in another.”

The Zody chair team used a method called Life Cycle Analysis (LCA) to assess all of the inputs and outputs in the product’s life cycle. Each material was examined to a minute level and rated according to environmental safety. The team then categorized, sorted and added up the total impact to arrive at a single number that represented how much the environment would be affected by the manufacture, use and disposal of the product. The score allowed them to make broad comparisons of the environmental impact of one product design over another. It also enabled them to evaluate tradeoffs and compromises to achieve the best results possible.

“Everything that had an acutely negative effect on human and environmental health was designed out of the product,” says Bonnema. That included carcinogens, sensitizers, chemicals that damaged DNA or disrupted the endocrine or reproductive systems, and a whole category of chemicals known as “persistent.” Persistent chemicals are those...
A Team Effort

The creation of Zody was not a sequential process where designers, engineers, and sustainability and ergonomic experts did their part and handed it down the line. Their collaborative and concurrent input ensured that all of their expertise was considered at every phase of development.

Armrest Adjustments
To enable users to maintain a comfortable neutral posture, Zody has a four-way adjustable armrest that can be moved up or down, side to side, front to back, and pivot.

Seat Adjustments
Designed to accommodate the body measurements of 95% of the world’s population, the Zody has a seat that adjusts up and down and slides forward and back to suit the user’s height and leg length.

Recycled Aluminum
For the base, recycled aluminum such as soda cans was used in place of chrome, which is made with toxic heavy metal hexavalent chromium. Powder coating also replaced less eco-friendly solvent-based paints.

Choice of Materials
In addition to leather and 100% recycled polyester, the Zody seat is offered in rapidly renewable fabrics such as cotton and wool.

Nylon Carpet Scraps
The adjustable arm column and lumbar adjustment shaft include 6.7% pre-consumer recycled glass-filled nylon, salvaged from the carpet manufacturing process.

Lumbar Adjustments
Concentric interconnected rings help maintain the natural curvature of the spine. The lumbar support can be height positioned to suit individual users and can be asymmetrically adjusted to apply different pressure to each side of the back, according to preference.

Gel Seat Option
The Zody comes with a gel seat option that reduces pressure on the user’s lower hip area and eases lower back muscle activity.

Easy Disassembly
With simple hand tools, Zody can be disassembled in about 15 minutes—very important since 98% of the parts are recyclable. Also, using the same material for multiple components makes it easier and more cost-efficient to salvage parts for recycling.

Recyclable Polyester
No heavy metal anterior is used to treat the polyester mesh back, so the material can be mechanically and chemically recycled without risk.

Ergonomic Features
Sustainable Features
Zody contains up to 51\% recycled content and is up to 98\% recyclable at the end of the chair’s life. Its assembly plant in Michigan has also been certified ISO 14001 since 2000.

Ingredients designed out of the Zody chair. Instead, the Zody team relied on materials vetted by the MBDC Cradle to Cradle Design Protocol and fully assessed down to the 100 parts per million level as safe for human and ecological health. Developed by McDonough Braungart Design Chemistry, the Cradle to Cradle principle argues that all things should be made completely recyclable or completely biodegradable to ensure zero impact on the earth.

In place of chrome, Haworth designers and engineers opted to use polished aluminum for a number of parts of the Zody chair. “Aluminum not only offered the flexibility, strength and appearance we sought,” says Bonnema, “it can be recycled indefinitely without significant degradation of properties.” He adds that recycled aluminum only takes 3\%-5\% of the energy that is needed to make aluminum from raw materials and is readily available.

Other components such as color dyes were chemically adjusted to protect the biosphere. PVC, a low-cost but highly controversial antimicrobial plastic used on chair arms, was replaced by polypropylene and thermoplastic urethane. A glass-filled nylon, made with 67\% pre-consumer recycled content, primarily scrap from carpet manufacturing, was used on 31 parts, most visibly in the adjustable arm column and lumbar adjustment shaft. Powder coatings for metal were substituted for solvent-based paints. Heavy metal antimony, used to treat polyester for mesh seats and backs, was eliminated. Rapidly renewable materials such as cotton and wool were offered as seat fabric choices.

“Material chemistry analysis at the start of the project means that if the product ends up in landfill, safety concerns are virtually eliminated,” says Bonnema.

Beyond recycling, Haworth is dedicated to reducing its carbon footprint. The Zody assembly plant in Allegan, Michigan, uses 100\% Green-e wind power. This renewable energy for manufacturing has been shown to prevent the emission of 1,423,000 pounds of carbon dioxide in the first two years—the equivalent of taking 124 cars off the road.

Also, although a relatively small user of municipal water, Haworth is working to eliminate the phosphate wash system used in its Allegan plant to mitigate the amount of treatment that its process water needs before being returned to the municipal system.

While Haworth has made operational changes and adopted tradeoffs in materials for the sake of the environment, it has not compromised on the aesthetics and functionality of its products. In aiming to create a high-performance chair, Zody designers and engineers conducted a joint study with the Human Performance Institute of Western Michigan University to identify the best way to protect the lower back. Based on the study, they developed a revolutionary ergonomic feature, called PAL™, that combines strong back support and passive pelvic support.

The asymmetrical lumbar support system allows the user to increase support to either side of the lower back independently, depending on personal preference. Zody is the only task chair in the market that provides asymmetrical lumbar support without forward displacement.

Additionally, to address differences in user body measurements (height, weight, hip breadth, etc.), Zody features four-way adjustable arms, a sliding seat, and a balanced three-point tilt mechanism—an overall range of adjustments designed to accommodate the body types of 95\% of the world’s population in a single chair. It also offers a gel seat option that reduces pressure on the user’s lower hip area as well as lower back muscle activity. Zody is the first task chair endorsed by the American Physical Therapy Association.

This attention to ergonomics and sustainability has not hurt Zody’s aesthetic appeal at all. In fact, Zody has garnered a number of prestigious design awards, including honors from IDEA and NeoCon.

The Zody assembly plant uses 100\% Green-e wind power, which in the first two years alone prevented carbon dioxide emissions equal to taking 124 cars off the road.

“It has become clearer that good products and green design go hand-in-hand,” says Bonnema. “As we design greener products, we find people like them better. Our market, primarily Fortune 1000 companies, also is going through a transformation and they want to know how green we are. It used to be that moving toward sustainability was an option if the company wanted to do the right thing. It is rapidly not an option anymore. You need to fully embrace sustainability. Companies that are sitting and waiting are going to be left behind. No question about that.”
Environmental Logos

These days consumers won't simply take a company's word that it is sustainably responsible. They demand corroboration from knowledgeable third-party entities, whether a nonprofit environmental organization or a government agency. As a result, many environmental interest groups have issued detailed guidelines on what they deem best practices. Companies seeking their endorsement must submit to rigorous third-party audits to prove they live up to these standards before being certified to affiliate their name with the organization's. Those that pass muster proudly do so on printed collateral, packaging, advertising and other media. Permission to display an organization's logo is like a seal of approval. Other environmental groups do not have certification programs and are strictly educational, but their logos have become as familiar as Smokey the Bear. Here are some marks related to "green" causes. Take this quiz to see how many you know. The names of some groups have been dropped from the logo so we don't accidentally give away the answer.

Match Them Up

A. EPI Green Energy Standard
B. Corrugated Packaging Recycling
C. Plastic Recycling (Polyethylene Terephthalate)
D. Dolphin Safe
E. MSC—The Marine Stewardship Council
F. Green Dot
G. Forest Stewardship Council
H. European Eco Label
I. Climate Cool
J. Energy Star
K. WWF—World Wildlife Fund
L. Glass Recycling
M. SFI—Sustainable Forestry Initiative
N. Green-e
O. Rainforest Alliance
P. PEFC—Programme for the Endorsement of Forest Certification
Q. The Designer's Accord

Answers on page 18.
The World’s Greenest Museum

In designing sustainability into the new California Academy of Sciences building in San Francisco, renowned architect Renzo Piano turned it into one of the museum’s most powerful educational exhibits.

Unlike most world-famous architectural landmarks that tower into the sky, San Francisco’s new California Academy of Sciences building, which will open to the public in September 2008, probably is not even visible from the air. Its living roof blends into the lushly green Golden Gate Park and looks very much like someone lifted up a piece of the park and put a building underneath.

That is exactly the effect that Italian architect Renzo Piano wanted. “The special thing about this building is its setting in the middle of Golden Gate Park,” he explains. The other thing that was special to Piano was the fact that it would house a natural history museum. “I’ve designed a number of art museums, but designing a natural history museum is different,” he says. “It’s more about discovery, wonder and exploration, more about a connection between the space of the museum and the environment you are in.”

Piano’s beliefs reflected those of the Academy. A San Francisco landmark for more than 155 years, the California Academy of Sciences is the only institution in the world to combine a museum, aquarium, planetarium, and world-class research and education programs for 11 fields of scientific study under one roof. Damages sustained during the earthquake of 1989 necessitated replacing the cluster of old Academy buildings in Golden Gate Park.

The Academy seized the opportunity to develop a structure that would match its mission. “Science is more influential and relevant to our daily lives than ever before, and natural history museums can and must deal head-on with the issues of the 21st century,” says Academy Executive Director Dr. Gregory Farrington. “Our goal is to create a new facility that will not only hold powerful exhibits but serve as one itself, inspiring visitors to conserve natural resources and help sustain the diversity of life on earth.”

In 2005, the Renzo Piano Building Workshop, in collaboration with local firm Stantec Architecture, was commissioned to come up with a 21st century eco-friendly design that unified the Academy’s original array of 12 buildings.

Piano approached the project as he does all others. “As an architect, the first thing you have to do when you have a new job is walk on the site and try to understand the geography and topography of the land,” he explains. “Places talk. They have a story to tell...If you listen, a lot of things come to you. This is fundamental to architecture: to be able to grab all those things, and take them in your hands to make the design...Having no preconceptions in a job is essential. If you have preconceptions, you impose your style on the project. Every time you have to solve problems with new materials and new techniques.”
Piano says he saw clearly that the building had to address a couple of problems. Because of its location in a park, "First, it couldn't be too aggressive; that meant it shouldn't be too tall." However, he was told that the planetarium and proposed rainforest had to be 70-90 feet tall, and the aquarium had to rise 60 feet. "The idea came to me to make a flat roof, like a flying carpet, and in the places where you needed to put the planetarium and the rainforest, it could curve up and curve down. It makes it more organic, a bit like it's growing."

That immediately suggested a planted landscape growing on the contours of the roof. "The living roof is a fundamental piece of the building," Piano says. "It is actually one of the exhibits in the museum." Piano envisioned steep undulations in the roofline rolling over the domed planetarium, rainforest and aquarium, echoing the topography of the building's setting and evoking the interdependence of biological and earth systems.

Maintenance of the roof, however, was a concern. The plants growing on the 2.5 acre roof had to be self-sustaining, without needing artificial irrigation and extensive care. Academy botanists worked with a team of architects and living roof experts to identify native plants that were well adapted to the coastal climate and hospitable to native birds, butterflies, and beneficial insects. Nine hardy species—four perennials and five annual wildflowers—were chosen after extensive testing and grown off-site in flat, biodegradable trays before being interlocked in place on the roof.
Banner Mock-Up
To show what visitors will see, designers used Photoshop to create a digital mock-up of 10-foot long banners facing the entrance to the museum. This view looks across the music concourse and at the plant-covered "HCS" on the living roof.

Piano says he saw clearly that the building had to address a couple of problems. Because of its location in a park, "First, it couldn’t be too aggressive; that meant it shouldn’t be too tall." However, he was told that the planetarium and proposed rainforest had to be 70-90 feet tall, and the aquarium had to rise 60 feet. "The idea came to me to make a flat roof, like a flying carpet, and in the places where you needed to put the planetarium and the rainforest, it could curve up and curve down. It makes it more organic, a bit like it’s growing."

That immediately suggested a planted landscape growing on the contours of the roof. "The living roof is a fundamental piece of the building," Piano says. "It is actually one of the exhibits in the museum." Piano envisioned steep undulations in the roofline rolling over the domed planetarium, rainforest and aquarium, echoing the topography of the building’s setting and evoking the interdependence of biological and earth systems.

Maintenance of the roof, however, was a concern. The plants growing on the 2.5 acre roof had to be self-sustaining, without needing artificial irrigation and extensive care. Academy botanists worked with a team of architects and living roof experts to identify native plants that were well adapted to the coastal climate and hospitable to native birds, butterflies, and beneficial insects. Nine hardy species—four perennials and five annual wildflowers—were chosen after extensive testing and grown off-site in flat, biodegradable trays before being interlocked in place on the roof.
A Natural Structure
The new California Academy of Sciences is designed to blend into Golden Gate Park and be a living expression of the Academy’s mission to explore, explain and protect the natural world.

Lighting
Photoreceptors in the lighting system automatically dim artificial lights in response to daylight penetration. The light cansisters echo the color of the Golden Gate Bridge.

Piazza
Visitors enter the museum through the central piazza, which has a vented glass ceiling to guide fresh, cool air in and remove stale air. The spider-web design of cables was inspired by nature.

Coconut Husk Trays
The 1.7 million plants were started in 50,000 biodegradable coconut husk trays that could be easily installed on the sloping roof.

Living Roof
The 2.5-acre living roof is planted with nine native species. The hardy plants insulate the roof, capture rainwater, and provide habitat for butterflies, hummingbirds and beneficial insects.

Photovoltaic Cells
The building’s outdoor canopy is embedded with 60,000 photovoltaic cells, which will generate between 5-10% of the Academy’s power.

Motorized Windows
Motorized windows will automatically open and shut to allow cool air into the building.

Denim Insulation
About 68% of the building’s insulation is from recycled denim, an appropriate material for a city that gave the world the first blue jeans, made by Levi Strauss, in 1873.

Swamp Tank
Visitors will be able to view the alligators and alligator snapping turtles in the swamp tank upon entering the Steinhart Aquarium as well as from an underwater window.

Rainforest Dome
Inside this dome, a winding ramp takes visitors up four stories, introducing them to inhabitants of living rainforests from Borneo, Madagascar, and Costa Rica, and then down into an underwater tunnel to the Amazon River Basin exhibit.

Planetarium
To give visitors the sensation of sitting amidst the stars, the planetarium’s 90-foot dome is tilted at a 30-degree angle and cantilevered out over the museum's 212,000-gallon Coral Reef tank.
The plant-covered roof is more than just educational and beautiful. It is expected to provide excellent insulation, keeping interior temperatures about 10 degrees cooler than a standard roof and reducing low-frequency noise by 40 decibels. It will also absorb about 98% of all storm water, preventing up to 3.6 million gallons of runoff from carrying pollutants into the ecosystem each year.

Another benefit of this roofline is that the domes of the Academy’s planetarium, rainforest and aquarium slope at the center in excess of 60 degrees, guiding fresh, cool air into a vast central piazza and circulating hot, stale air out through high-point vents.

Computer modeling determined optimal locations for portal-like windows in the domes to maximize sunlight into the living rainforest and coral reef exhibits without overheating the rest of the building. The windows are designed to open and close automatically to allow natural ventilation. Photometers in the lighting system will also dim artificial lights in response to daylight penetration, reducing the energy necessary to illuminate interior spaces. Part of that energy will come from solar cells embedded in the glass canopy that surrounds the outer perimeter of the building. As with so many other features of Piano’s design, the solar cells are not hidden from view, but are made an integral part of the building’s aesthetics.

“The solar cells cast a shadow on the space beneath them so the light around the building is not flat,” says Piano. “[The light] actually vibrates. I like very much the idea that the solar cells take the energy from the sun and also project a shadow.”

This embodies Piano’s approach to architecture, which he says, “is not just about making walls, floors, and ceilings. Architecture is the art of making emotion. I think that the two most important emotions of the building are the sense of vibration of the light and the sense of continuity between outside and inside.”

Piano intended his design to create a feeling of transparency and connectedness between the building and the park through selection of materials and arrangement of space. He used glass extensively in the exterior walls, so visitors can look through the museum to the surrounding green space. Visitors enter through the piazza which has a glass ceiling revealing the sky above. To maintain an open, airy feel, even the central support columns were made extremely slender through the construction of a fascinating “spider web” of carefully configured cables designed to prevent the slim columns from bending.

“Museums are not usually transparent,” says Piano. “They are opaque, they are closed. They are like a kingdom of darkness and you are trapped inside. You don’t see where you are, but here we are in the middle of a beautiful park, so you want to look out.”

Some of the building’s most sustainable features are not visible to the public. The structural framework is made from recycled steel. The insulation for the building is made from shredded blue jeans—an appropriate choice for San Francisco, which is the home of Levi Strauss, the company that made the world’s first blue jeans for California gold rush miners in 1853.

African Penguin
One of the 21 dioramas in African Hall will feature a colony of live African Penguins. The 20 penguins will slip and dive in a 25,000-gallon tank, complete with simulated waves and realistic daytime nighttime lighting.

In addition, the building’s proximity to the Pacific Ocean, a few miles away, will enable the Academy to pipe in ocean water directly and cycle it through natural filtration systems for the Steinhart Aquarium’s salt water tanks.

Although the new Academy building will not open to the public until this fall, it is being hailed for its sustainable design. It will become the first museum to earn a LEED™ (Leadership in Energy and Environmental Design) Platinum certification from the U.S. Green Building Council. It has already received the 2005 silver Holcim Award for Sustainable Construction and the 2006 Environmental Award for sustainable design from the Environmental Protection Agency.

The awards validate the Academy’s and Piano’s objectives from the start. “A natural history museum is not just the place where you show science,” Piano says. “It is also the place where you discover science. When you study science, you realize that the earth is fragile. So this building has to be one of the most sustainable buildings in the world.”
The New Annual Report

What are you doing to ensure a sustainable planet? The public is demanding to know, and an increasing number of companies worldwide are complying by issuing annual corporate responsibility reports.

At a time when SEC-mandated financial annual reports run the gamut from minimalist "10-K wraps" to traditional books with photographs, charts and thematic messages, a new category of annual reports is emerging. Companies give them various names—Corporate Responsibility Review, Global Citizenship Report, Sustainable Development Report—but their intent and purpose are basically the same: to address pertinent environmental, social, community and sustainability issues, define specific objectives, and benchmark progress.

Although companies are not required by law to produce such reports, an increasing number do. In Europe, about 90% of the top companies publish corporate responsibility reports, averaging 72 pages, according to CorporateRegister.com. Nearly two-thirds of companies in non-transatlantic nations, including Japan, Brazil and Australia, do too, with an average page count of 64. Recently U.S. businesses have adopted this practice, with the majority of the top 100 American companies now publishing reports averaging 44 pages.

Also noteworthy is that companies that are not publicly held issue corporate responsibility reports too. Universities, medical facilities, agricultural concerns, transportation lines and other businesses are responding to stakeholder demand for greater transparency and accountability. Today even shareholders who want to protect the value of their investment recognize that sustainable performance depends on a healthy "triple bottom line"—environmental, social and financial.

Since no disclosure rules dictate what must go into a corporate responsibility report, information varies broadly, but typically focuses on specific issues relevant to that business. Protection of human rights in overseas operations, employee health and workplace safety, use of toxic substances, renewable energy and conservation, waste management, size of carbon footprint, animal testing of drugs and cosmetics, environmental chain-of-custody oversight, water and air quality, recyclability, environmental partnerships. These are some concerns that global watchdog groups closely monitor, ready to catch and expose scofflaws on Internet blogs and postings.

To bear up under this scrutiny, the majority of corporate responsibility reports surveyed avoid speaking in generalities and in a marketing tone of voice. Instead they focus more on what they are actually doing, reinforcing their message with tables and graphs and evocative color photography. Here are some ways that companies and institutions are communicating their sustainability efforts effectively.
The Coca-Cola Company
40 pages plus cover, 9"x10.5"
The Coca-Cola Company, which calls itself "a local business on a global scale," operates in more than 200 countries. As such, reporting on the ways it supports communities encompasses the entire world. Its performance reviews by geographic area include specific initiatives, ranging from bringing electricity to a health care center in Uganda to supporting HIV/AIDS awareness in China. Water stewardship and sustainable packaging are critical commitments wherever it operates.

Stanford University
12 pages plus cover, 7.5"x11.75"
Environmental leadership, innovation and conservation are the three pillars of Stanford University's sustainability program. Its report lists achievements that range from retrofits in student housing to save 50 million gallons of water annually to reducing the number of single-occupancy commuter vehicles on campus from 72% in 2002 to 52% today. Other programs include new buildings that introduce green innovations and an Energy Crossroads conference that brings together sustainability leaders from the government, nonprofit, business and academic sectors.

Target
16 pages self cover, 8.5"x11"
Target's corporate responsibility message focuses on community and environmental activities in North America, where it operates approximately 1,500 discount retail stores in 47 states. The discount retail giant features initiatives that reinforce its consumer-friendly image by calling out projects, such as offering free apartments to families of long-term patients at St. Jude Children's Research Hospital to funding classroom field trips for school kids. On the environmental front, Target highlights its two LEED-certified sustainable stores and gift cards made from biodegradable material.
The Bicycle

By conservative estimates, over a billion bicycles exist in the world today. Bicycles are still the principal mode of transportation in many countries, including China. As vehicles go, they consume no fossil fuels and are aerobically healthy, not to mention easy to park.

Surprisingly, even though a student of Leonardo da Vinci reputedly sketched out all the parts of a bicycle around 1490, it wasn’t until 1818 that a German baron named Karl von Drais came up with a wooden vehicle with two wheels, a seat and handle bars. Unfortunately, the Draisienne, or “hobby horse,” had no pedals; the rider alternately walked and glided himself forward.

In 1839, a Scottish blacksmith invented a self-propelled bicycle—but it weighed 56 pounds and never caught on. In 1863, a Frenchman came up with a wooden bicycle with pedals that cranked only the front wheels forward. Although officially named the Velocipede (fast foot), many called it the “bone shaker”—a clue to how it rode.

In 1870, an Englishman rolled out a bike with a large front wheel and smaller back wheel that covered greater distances with less pedaling, but most riders kept falling off. In the 1880s, two Englishmen introduced successive inventions—the chain drive and a rear crank axle—followed by an Irish veterinarian named John Boyd Dunlop who developed air-filled rubber tires for a more comfortable ride. Finally, an affordable bicycle that appealed to the masses was born.

As fate would have it, the bicycle’s success in the marketplace was impeded by the first production of gasoline-powered automobiles in the 1890s. (Even the Wright brothers, who sold and repaired bicycles for a living, opted to concentrate on building an airplane.)

Still, bicycle innovations soldiered forward. The 1940s saw the introduction of built-in kickstands so bicycles could be parked upright. In the 1960s, 10-speed gear shifts became commonplace, and in the 1970s, mountain bikes made their debut. When it comes to improvements in bicycles, progress is slow but steady. Who knows what this century will bring?
A sustainable value in the home. GREENKITCHEN is Whirlpool Corporation's latest design concept that breaks new ground with the creation of a kitchen eco-system inspired by the cycles of nature. GREENKITCHEN's integrated system of appliances will help consumers to adapt, reduce and recycle—optimizing heat and water processes and saving up to 70% on their appliance energy bills.

Insync Marketing Solutions is committed to a greener cleaner planet. We don't do it because it's the "in" thing to do, we do it because we live here too.

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