



# The Next Big Product Opportunity

Many green products on the market today represent small enhancements or “tweaks” to existing ones. Recycled content replaces virgin materials; packaging is lighter or designed to be refilled; washing machines save water and energy by tumbling clothes on a horizontal as opposed to a vertical axis. Although these are admirable and much-needed technical achievements, the reductions in environmental impact they represent may not be enough to meet future consumer needs in a sustainable fashion.

Finding solutions to environmental degradation involves much more than replacing one supermarket cartful of goods with another. That is because our present modes of production and consumption are simply not sustainable — “sustainability” is defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs — in the face of a global population that is 5.8 billion today and expected to reach 10 billion by 2040.

Some experts go so far as to estimate that achieving sustainability over the next few decades requires a radical change in the entire production and consumption of industrial societies—a “system discontinuity,” characterized by a 90 percent reduction in the consumption of environmental resources.<sup>1</sup> Societies that run at 90 percent “eco-efficiency” eat lower on the food chain (*i.e.*, more plants and legumes as opposed to animal-based proteins); minimize the use of raw materials by recycling, reusing, and other means; and generate energy from renewable as opposed to fossil-fuel sources, which are not only quickly depleting but also contribute to global climate change and acid rain.

The issue of sustainability is especially critical for U.S. consumers. The United States represents 5 percent of the world’s population but consumes 30 percent of the world’s natural resources and creates 50 percent of global greenhouse gases. Since 1900, the U.S. population has tripled, while procurement of natural resources has multiplied 17 times.<sup>2</sup> Clearly, this is not sustainable. With developing countries looking to adopt Western lifestyles, pressures on global natural resources will intensify. Entire ecosystems such as the Florida Everglades are at risk of collapse.

Great strides are being made in the areas of information technology and “nano-technology,” which uses resources super-efficiently by building products one atom at a time. However, technological advances may not be enough. Major shifts in lifestyle will be necessary, as well as significant changes in how we meet basic human needs through the products and services we buy. We must leap rather than tweak.

Clearly, caring for the needs of a burgeoning population in a sustainable fashion presents opportunities for innovative companies. The purpose of this chapter is to provide a framework for thinking about solving environmentally related consumer issues creatively, and in doing so, offer some inspiration from history’s preeminent problem-solver—Mother Nature.

## WHAT IS GREEN?

Green products are typically durable, nontoxic, made from recycled materials, or minimally packaged. Of course, there are no completely green products, for they all use up energy and resources and create by-products and emissions during their manufacture, transport to warehouses and stores, usage, and eventual disposal. So green is relative, describing those products with less impact on the environment than their alternatives.

Ask the question “What is green?” If any certainty exists at all, too often the answer is “It depends.” That’s because the factors that make a product “green” often depend upon the specific product or product category, where it will be used, how often, by whom, and for what reason.

### What Is the Product Category?

Biodegradability, for example, may be a highly desirable feature for laundry detergents whose suds can pollute local waterways, but it may not be relevant for paper cups or plastic trash bags destined for landfills where decomposition occurs slowly, if at all, and stability—if the landfill is to support a new airport, for instance—is preferred. Conventional alkaline batteries are considered green if they contain no added mercury, but they are highly toxic nevertheless, because of the other materials they contain.

### Where Will the Product Be Used?

What might be green in my backyard may not be green in yours, because regional variations may exist in the amount or types of natural resources available, the local climatic and topographical conditions, and whether reduction, reuse, recycling, or composting are options. In a country as diverse as the United States, such conditions can vary dramatically from state to state, even from town to town. So, broadly speaking, washable cloth diapers may be envi-

ronmentally preferable in the Northeast where landfill space is at a premium and water is plentiful, but may be less desirable in the Southwest where water supplies are tight and there are still plenty of potential spots to bury trash. Because they take up less space, plastic supermarket bags may actually be environmentally preferable to paper bags where landfilling is the only option, but in areas where composting is a possibility, paper might be the optimal eco-choice.

### How Will It Be Used?

Is a product likely to be used once and thrown away, or used over and over again? According to one chemist, if a ceramic mug will not be used at least 1,000 times, then the energy it takes to make it doesn't justify its presumed environmental preferability over polystyrene.<sup>5</sup> Compact fluorescent lightbulbs cost more than incandescents for a reason: all those weighty materials consume a lot of energy in their manufacture and transport. If they are used in lamps that are turned on and off frequently, the long-term energy savings likely won't be realized; incandescents may be preferable.

### Are Alternative Technologies Available?

Environmental impact is literally designed into products up front. So existing products can only be tweaked so much before a jump to an entirely new or different technology capable of filling the same consumer need is necessary to make a significant improvement in environmental performance. For example, no amount of tinkering with incandescent lightbulbs (which throw off 90 percent of their energy in excess heat) will ever achieve the cooler-burning efficiency of compact fluorescents. Use recycled envelopes and stationery, fill the trucks with natural gas, but E-mail will always be environmentally preferable to even the greenest conceivable "snail mail."

Making "green" even tougher to pin down is the fact that no

agreed-upon method exists to measure the precise relative environmental impact of one product against alternatives. In the debate over cloth versus disposable diapers, for example, value judgments come into play—plastic and paper production and solid waste, or cotton production and the water and energy to wash the diaper?

### What Comes Next?

Environmental issues are constantly changing, reflecting new discoveries such as the hole in the ozone layer, shortages in natural resources, population shifts, and fewer places to bury everyone's trash. Technology is constantly advancing. Consumer tastes and attitudes evolve. Laws and marketing strategies are rewritten accordingly. Thus, no matter how well companies do their homework, what is accepted as "green" today may wind up being viewed as "brown" tomorrow. The aerosol industry and McDonald's learned this the hard way.

In the late 1970s, in response to reports linking chlorofluorocarbons to ozone layer depletion and subsequent consumer outcry, the aerosol-packaging industry quickly switched to hydrocarbon-based propellants. However, we now know that hydrocarbons create smog when mixed with sunlight; so the move is on to find a viable alternative, lest further sales be lost to pumps and other competitive technologies.

Since the 1970s, the packaging for McDonald's hamburgers has evolved from one technology to another in response to environmental as well as economic considerations. First, polystyrene foam replaced paper, but then was replaced altogether by quilt wraps. This much-heralded, source-reduced alternative may one day be replaced itself by compostable packaging, now in test. Environmentally speaking, the folks at McDonald's can't rest. Because of escalating global food demands, coupled with the environmental degradation associated with cattle-raising, the very beef in McDonald's Big Macs may soon be under fire regardless of whether it is produced domestically or in the Amazon rain forest.

With green a moving target, planning gets tricky; industry can only respond as quickly as the market demands. This poses the risk of rushing greener products to market to serve the demands of influential consumers while mass consumers may be unaware of the need for a change. The green marketplace is rife with examples of less than perfect timing such as the following:

- When competitors were moving toward 1/2-cup laundry detergent concentrations, Church & Dwight answered with a 1/4-cup formula for their own Arm & Hammer ultraliquid brand. But their sales suffered from confusion over the 1/2-cup “compacts” of other manufacturers. Acknowledging that consumers were prepared for only so much greenness at a time, the company reneged on the more concentrated alternative.<sup>4</sup>
- Introduced in response to a newly discovered need of chemophobics, Heinz’s Cleaning Vinegar, a double-strength version of its normal product, flopped when introduced into supermarkets as an alternative cleaning aid. The mass consumer didn’t seem to know what to make of it. While greater consumer marketing and educational efforts no doubt would have helped enhance its chance of success, the product opportunity may have been better served by a niche strategy, distributing the product in health-food stores and green-product catalogs until enough of the mass market was prepared to switch to the ecologically conscious offering.

Lack of precise definitions for “green” coupled with the “moving target” syndrome tend to discourage industry from making the long-term investments needed to develop new technologies and market the greener products that result. Recent history is rife with examples of industry losing its sticking power in the face of market uncertainty for green technologies. Solar power is just one case in point.

After a rush of government funding in response to the oil crisis of the mid-1970s, U.S. industry geared up to develop photo-

voltaics (solar) technology. But when oil became cheap and plentiful again, and the Reagan Administration withdrew support for the fledgling technologies, industry sold outstanding key patents to Japan, a country deficient in natural-energy sources. The Japanese now hold the lead in this key future energy source. There is hope that American industry has learned that when it comes to the environment, it pays to think ahead.

### NEED TO THINK IN NEW WAYS

Environmental concerns force today’s consumers to question their assumptions about what types of products best meet their needs. Paper no longer has to be white. Recycled content, once deemed inferior—even unclean—is now preferable to virgin. Disposable products, once associated with feelings of satisfaction (we were so rich as a country we could afford to throw things away!), make us feel guilty.

Question your own assumptions. Reevaluate your business strategies. Think differently about what it takes to meet basic human needs in a sustainable fashion. In the not-too-distant future, advantage will accrue to corporations that can transcend existing paradigms and product categories, redefining existing notions of how best to meet consumer needs. The future belongs to companies that can invent new designs, materials, and technologies that meet consumer needs with minimal, if not zero, environmental impact. It belongs to companies who can reinvent how existing industries operate, or create entirely new industries if necessary. Address consumers’ concerns credibly and profitably by integrating environmental issues into new-product planning and overall corporate strategy, as follows.

#### **Be Pro-Active**

Because availabilities of natural resources are in constant flux, new materials and technologies are forever being developed. Learning is always taking place. So, be ever-vigilant and plan ahead.

## Address Green Continuously

Because green is a “moving target,” unexpected shifts in consumer sensibilities can occur with the potential to wipe out entire markets or tarnish corporate reputations. So address environmental issues on a continuous basis in order to better anticipate such consumer shifts, control your own destiny, and steal a march on competitors when the time to respond approaches.

## Address Environmental Issues at the Design Stage

We cannot “tweak” our way to green. Design products and their packages *up front* to balance environmental challenges and consumers needs most satisfactorily. The introduction of the Woody Pen, marketed by the Goodkind Pen Company of Scarborough, Maine, demonstrates this strategy well.



### Case Study

#### Woody Pens: Designed for the Environment

Rather than making its pens of plastic, Goodkind Pen Company uses birch scraps sourced from local furniture makers, and its pens are designed to be refillable. As an alternate to conventional “blister” packs, Goodkind Pen displays its pens in an innovative plastic clamshell that can be reused and recycled. Consumers simply unsnap the package components, remove the pen and its refill, and drop the package in a mailbox so that it can be returned to Goodkind.

By carefully designing its product up front for minimal environmental impact, Goodkind yields a product with a super-green profile and, in the process, enjoys a high level of satisfaction from both environmentally conscious consumers, as well as other consumers who enjoy the comfort and economic benefits of using a refillable wood-based pen.

## Change the System, Not the Product

Environmental issues are holistic in nature. Often the most significant environmental impacts occur when the entire system of design, manufacturing, distribution, and reuse/disposal is overhauled, rather than just one or two features of a specific product or package. Knoll Furniture reduced packaging required for new office installations by 90 percent by lining the trucks and amending the loading docks rather than by “tweaking” the wrappings on individual pieces of furniture.

As a way to cut out milk-carton-type packaging altogether, Coca-Cola has explored siphoning syrup directly from trucks into holding bins at fountains and fast-food restaurants. In California, an entrepreneur sells carbonated-water taps along with syrup so consumers can make popular brands of soft drinks like Diet Coke and Sprite at home. His innovation represents a packaging and energy-saving alternative to pre-mixed bottles of pop that need to be transported to and from stores.

Changing the system by which products are designed and sold—or shall we say, changing the way benefits are delivered or consumer needs are met—suggests many opportunities for resource and energy-saving innovation, such as integrating products within the household infrastructure. Such staples as sugar, flour, salt, and pepper are sold in bulk, ready to be transferred within the home to permanent packages like sugar bowls, salt and pepper shakers, canisters, and the like. Similarly, household paper towels and toilet tissue are designed to fit neatly into permanent wall mounts. Why not consider selling permanent packages for your own products?

Some permanent packages are already finding their way onto supermarket shelves. Church & Dwight, for example, markets a refillable plastic shaker for its Arm & Hammer baking soda. Good Seasons salad dressing mix has long been accompanied by a free glass cruet. Liquid household and personal-care products, such as shampoos, liquid dishwashing detergents, and other cleaners, are starting to be sold in bulk for transferral to dispensers inside the

home. Opportunities exist to market attractive dispensers. Given the flimsy nature of some spray bottles, an opportunity exists for manufacturers to sell permanent, dishwasher-safe packages designed for use with the collapsible-pouch packages now marketed as refills for popular household cleaning products.

One company that believes in the potential for permanent packaging is Rubbermaid, makers of Litterless Lunch Kits. Designed to replace brown bags, juice boxes, plastic baggies, and foil wraps, the kits are durable and reusable and come in an array of sizes and styles. For example, a whimsical Gilbert the Fish appeals to kids under five. Gilbert provides easy access to lunch through his oversized mouth, which unzips to fold down as a placemat. His tail fin hides a zippered compartment for milk money, keys, and other small items. Sold at Wal-Mart and grocery stores, the lunch kits retail from about \$10.<sup>5</sup>

Consider refillables at retail. Where allowed by law, The Body Shop allows consumers to refill cosmetics jars from a special refill bar. In Germany, consumers refill milk bottles from a steel cow. The potential for refilling suggests the prospect of in-store “real estate” for product manufacturers. Individual brands of cereal and coffee, for example, would be allotted permanent dispenser space on store shelves.

### **Be Flexible**

Since environmental ills can vary by region as well as from season to season, opportunities exist for new market segmentations and line extensions akin to those used by sophisticated packaged-good marketers. Consider coffee.

Coffee drinkers have it made. At the supermarket shelf, they can pick among all-method grinds, drips as well as instant, freeze-dried, whole bean, and coffee-for-one “tea” bags. Coffee enthusiasts can shun the regular stuff for Flavored coffees like French Vanilla and Swiss Mocha Almond, as well as espresso and the exotic blends like Arabian Mocha Sanai sold in specialty shops.

Depending upon the distribution channel and the brand, packages can be steel cans, glass, aseptic packs, or kraft paper bags.

Marketers of green products can adopt similar Flavor, formulation, and packaging variations. With the diversity of green issues around the country and around the world, a customized approach may represent the best chance for minimizing environmental impact.

### **Diversify Offerings**

For example, allow consumers to choose packages made of materials that accommodate local capabilities for recycling, composting, or landfilling. Differentiate on the basis of product formulation. Melitta, for example, simultaneously markets both unbleached and bleached white coffee filters.

Although it sounds counterintuitive, offering a product with a “greener” profile right alongside one’s historical “brown” product does not necessarily send a conflicting message about a company’s green commitment. Empirical evidence suggests consumers are grateful for the choice. From a practical standpoint, the marketing of “greener” products alongside traditional offerings helps to serve the needs of that broad swath of consumers who may not yet be acting upon certain environmental issues, while having an alternative handy when they are ready to “trade up.” Some marketers choose to avoid this dilemma in the first place through selective distribution strategies, alternative branding, or discontinuing the conventional product/technology at the “greener” one’s introduction.

### **Take the High Road**

Maximize the long-term payout of product development efforts by adopting the most environmentally sound technology, materials, or designs possible within the constraints of economics and consumer acceptance. This can also provide opportunities to preempt competition and avoid costly legislation. In the process, it can pay off

in positive publicity and enhanced brand and corporate imagery often associated with leadership.



### Case Study

#### The McDonough Collection: Textiles with Zero Impact

The William McDonough Collection of environmentally preferable fabrics manufactured by DesignTex Inc., of New York City, is just one example of a product line with the lofty goal of zero environmental impact. Created by the designer and architect for which it was named, the collection relies on a proprietary process that eliminates all toxic by-products at every step in the manufacturing process; the factory effluent actually leaves cleaner than it was when it came in! What's more, the fabric actually biodegrades safely into soil, leaving no carcinogens, persistent toxic chemicals, heavy metals, or other harmful substances. (Compare this to the estimated 127 heavy metals in the average silk tie!)

For the fabric, McDonough chose natural wool from New Zealand and ramie from the Philippines that is compostable and grown without pesticides or synthetic fertilizers. The fabrics are then dyed with a selection of only 16 pigments culled from a possible 4,500 commonly used in textiles that could be manufactured without releasing pollutants. By-products from the weaving process are shipped to strawberry farms near the manufacturing plant in Heercregg, Switzerland, where the biodegradable scrap fabric is used in place of plastic as ground cover.

The fabrics have found a ready market among high-end furniture manufacturers, designers, and architects who appreciate its uncompromising attention to aesthetics as well as its environmental sensibilities.

### Rethink the Value Your Products Provide

When it comes right down to it, consumers don't really need cellular telephones, designer clothing, or subcompact cars. They need to communicate, to stay warm, and to be transported from place to place. And if you really think about it, consumers don't need to own products per se; what they really need is the *utility* such products provide. Take a giant mental leap forward by rethinking your own products with these concepts in mind! You'll likely discover innumerable fresh new opportunities to increase profits and enhance customer loyalty. As long as you're thinking big, go so far as to consider selling services as replacements for, or adjuncts to, material products.

As identified by various, mostly European, experts working in what might just wind up to be the most exciting area of new product development in the future, four different groups of services are possible:

- Product-life extension services—services designed to extend the life of products, *e.g.*, technical assistance, repair, maintenance, and disposal service
- Product-use services—the sharing of products as well as using products for some time without the need to buy, *e.g.*, a “Greenwheels” car-sharing service now offered in the Netherlands
- Intangible services—substituting products for labor-based services, *e.g.*, automated bill-paying and in-home voice mail as a replacement for answering machines
- Result services—services designed with the aim of reducing the need for material products, *e.g.*, pedestrian access rather than cars, urban recreation facilities rather than forced tourism<sup>5</sup>

Does your product pose a solid-waste challenge in terms of bulk and/or toxics? Consider leasing rather than selling it outright. Leasing provides an opportunity to maintain control over one's product throughout its entire life cycle. This translates to a cost-effective source of raw materials and it can help reduce liabilities stemming from irresponsible disposal by others. To reap these benefits, some chemical companies now lease their products, and some office equipment manufacturers now lease rather than sell copy machines. Although not marketed as such, manufacturers of toner cartridges who take their products back at the end of their useful lives (in this case, by providing for free pick-up at consumers' homes and offices) are in effect leasing the use of their products.

Many manufacturing companies can easily sell services as an adjunct or as a replacement to their own or another company's products. Appliance makers such as GE and Whirlpool already enjoy hefty revenues from service contracts. Electric-power utilities sell energy-conservation services in addition to power. Manufacturers of electric power mowers would do well to consider selling Xeriscaping services—using water-conserving native shrubs and grasses in water-short areas, for example—or potentially lose out to competitors outside their category. Ridding one's dress shirt of a greasy stain takes knowhow in addition to soap and elbow grease. Prediction: in addition to converting natural resources into Ajax and Biz, the big soap companies will convert *human resources* into paid-telephone-advice lines on spot removal.

Consider services, too, for their potential to lock in customers over time. It can be said that Ametek (see Chapter 8) is in the business of helping Ethan Allen protect furniture rather than manufacturing polypropylene. Instead of selling a product once, consider leasing, or even giving the product away and selling the refills. Think of the opportunities for manufacturers of coffeemakers, electric toothbrushes, and soap dispensers, all of whom have an incentive to make their initial products more durable, too.

## GETTING STARTED: ASK "HOW WOULD MOTHER NATURE DO IT?"

The most fertile source of inspiration for companies in search of innovative methods to meet consumers' needs in environmentally sound ways is Mother Nature herself. For centuries, product and package designers have been inspired by her ingenious designs and technologies. Think about it: Cameras mimic the human eye. Helicopters hover and fly backward like hummingbirds. Velcro fasteners adopt the same entangled architecture as the prickly burrs attached to their Scottish inventor's boot.

By definition, green products are more nature-like: they are inherently efficient, easy to recycle, and often driven by solar power. Consider some of the greener products and technologies on the market today. ENERGY STAR computers save on energy by hibernating when not in use. Solar cells on the roof of Mazda's 929 run a ventilating system when the car is parked in the sun. Like peas in a pod, rolls of Kodak film stacked in one box instead of sold separately cut down on packaging waste.

The principles of nature have been incorporated into a creativity process invented by the author to generate concepts for new products and services that represent minimal environmental impact. Some of the strategies contained in this *Getting to Zero*<sup>SM</sup> process include the following:

### Keep It Simple

A banana peel is a deceptively simple package. It protects its contents, it is easy to open, it eliminates the need for utensils, and it signals when its contents are ripe. How many human-designed packages can claim as much?

Trees are equally elegant in a multipurpose sort of way. When alive, they provide food, shelter, and shade, not to mention inspiration for poetry and a place of lofty refuge for kids. When natu-

rally felled in the forest, they become food and home for a whole new host of organisms and wildlife. When felled by humans, they provide any number of useful products including paper, furniture, and wooden pencils.

In packaging a key to simplicity is source reduction—using designs that require less material in the first place. Since source reduction means the elimination of the very bells and whistles that make some types of packaging so convenient, this can be tricky. Colgate-Palmolive addressed this issue literally quite neatly in designing a new toothpaste tube that eliminated the need for an outer carton.

Colgate-Palmolive proved that one doesn't have to give up convenience in a source-reduced package when they introduced stand-up tubes in the fall of 1992. Prompted by retailers in Germany, where customers have the right to leave unwanted packaging behind, Colgate's innovation eliminates the traditional outer carton by allowing the tube to stand on its own via the use of a flat-top pad nozzle. Because it is powered by gravity, it solves the age-old problem of emptying the tube completely—a worthy environmental goal all by itself.

The revolutionary new tube design uses 20 percent less primary packaging material than a regular laminated tube and it has only four parts compared to as many as ten components in typical pumps. It also costs less than a pump. In the United States, it has attracted a loyal following of consumers who like its heightened convenience: the vertical storage feature keeps the toothpaste ready to dispense, and improves neatness and ease of use.

### Grow Your Products Green

Nature's own economy is plant based and solar based. Biologically based products are starting to displace alternatives made from chemicals on supermarket shelves. Liquid Plummer, for example, markets a drain cleaner that uses the power of enzymes to literally eat through food and grease. Some consumers prefer cleaners that are made from d-limonene, nature's own solvent, extracted from orange peels in the orange-juice-making process.

Consider the stories of Fox Fibre and Citra-Solv, two innovative natural products on the market today.



#### Case Study

#### Fox Fibre: Dyed by Nature

Consumers know that a bright, white cotton T-shirt feels natural. What they don't know is that it takes tons of herbicides and pesticides and millions of gallons of water to grow the cotton plants, which are sprayed with a chemical defoliant to prevent leaf-staining. The resulting fiber is then saturated with bleach, or dyed with any number of potentially toxic chemicals.<sup>7</sup>

Sally Fox, founder of Natural Cotton Colours, Inc., of Wick-enburg, Arizona, has a better idea: she grows cotton that is colored naturally. Fox discovered that ancient peoples grew their cotton in bright colors. After ten years of experimentation, she produces cotton that yields beautifully colored fibers in hues of brown and green (she is currently working on blue). Her colored cotton is also naturally resistant to pests, so it requires fewer pesticides than conventional cotton. Also, because the resulting fabrics are naturally colorfast, there's no fading. In fact, the colors actually intensify with the first fifteen washings. The hues are naturally warm and elegant.

Starting with a mere six plants, Fox's business now grows enough product to supply cotton to yarn spinners in ten different countries. Companies such as Fieldcrest, IKEA, and Levi Strauss use this company's naturally colored fibers in their products. Finning has contributed to success—people concerned about the environment are drawn to Fox Fibre for its unique characteristics and are also willing to pay a slight premium. In 1993, when L. L. Bean first offered a Fox Fibre sweater for \$39, it sold out in a week.<sup>8</sup>



### Case Study

#### **Citra-Solv: Nature's Own Cleaner**

In a marketplace where all the leading products are made from a profusion of sometimes nasty-sounding synthetic chemicals, Shadow Lake's Citra-Solv® cleaner and degreaser stands apart. It is made almost entirely from d-limonene, nature's own degreaser, extracted from orange peels left over from the juice-making process.

Citra-Solv was originally created for the commercial and industrial markets. When OSHA regulations required that chemicals used in cleaning products be disclosed on product labels, Steven and Melissa Zeitler, founders of Shadow Lake, Inc., got the idea to take the product retail when employees, enamored with the product's fresh orange smell, asked to take some home.

Helping to debunk the myth that "green" products don't work as well as their "brown" counterparts, Citra-Solv quickly rubs out lipstick stains, chewing gum, adhesive goo, and easily tackles greasy barbecue grills and automobile wheel rims.

Distributed in over 90 percent of health-food stores and environmental-product catalogs, where it is typically a bestseller, and now a growing number of specialty-food stores, Citra-Solv represents a multimillion-dollar business. A recent partnership with the USDA's Alternative Agricultural Research and Commercialization Corporation providing marketing support promises to grow this product made from renewable resources even further.

### Think in Circles

In nature there's no such thing as waste everything is recycled. Soil, for example, represents decomposed plant and animal matter poised to support new life. Water is constantly being transformed in a new-

ending cycle consisting of evaporation, condensation, rainfall, and evaporation.

A growing brood of "industrial ecologists" now urges manufacturers to shift their thinking from a linear "cradle-to-grave" mode to a more circular "cradle-to-cradle" approach. Their recommended strategies—recycling, reuse, remanufacturing, and composting—all represent opportunities to create valuable new uses for products that would otherwise be dead-ended in landfills.

As Xerox has discovered, thinking in circles provides opportunities to save money and maximize return on assets through recycling and reuse of materials or components. New markets can be created for goods that are refurbished and resold. By thinking in circles, John Deere saves money and avoids landfill issues through an innovative reusable packaging system.



### Case Study

#### **Xerox: Where Thinking in Circles Pays Off**

Xerox Corporation is a big believer in remanufacturing. No wonder. They have saved \$200 million in materials and parts cost in less than five years by remanufacturing some of their copiers, using the same assembly line to produce newly manufactured as well as remanufactured machines.

In Europe, Rank Xerox markets the two types of machines as separate product lines. The lower-cost remanufactured line allows Xerox to competitively price against other manufacturers; in the United States, the machines are sold in the same product line. The remanufactured machines match Xerox's high expectations for new machines, and according to company surveys, consumer acceptance of the remanufactured machines, which come with a three-year performance guarantee, has increased in the past five years.<sup>9</sup>

Try recycling the wastes of another industry, or look for innovative ways for other manufacturers to turn your own waste into gold. The toy industry has created a huge market for the integrated circuit boards that are quickly made obsolete by rapid advances in computer chip technology. In a most symbiotic way, the used-chip market has flourished due to the growth in the number of toys utilizing computer technology, while the toy industry benefits from the availability of low-cost chips.<sup>10</sup>



### Case Study

#### John Deere Saves Money Through Reuse

The John Deere Company of Horicon, Wisconsin, enjoys the opportunity it created to save money by pioneering the notion of reusable shipping crates. It chooses to go beyond compliance of state laws prohibiting the landfilling or burning of corrugated containers and opts for reusable/returnable plastic containers for the 5,000-plus components arriving at its farm-equipment factories. Deere, which owns the containers, provides them to its parts suppliers for shipping tractor components to assembly plants; the assembly plants return the empties in a continuous loop. Made of high-density polyethylene, the containers resist rust, mildew, and splintering and can be cleaned with soap and water.

By thinking in circles, Deere has eliminated 1,200 truckloads of non-recyclable corrugated cardboard going to landfills annually.<sup>11</sup> Disposal costs translated into bottom-line savings of approximately \$1.5 million in 1995.<sup>12</sup>

### Go with the Flow

Look for opportunities to harness nature's own technologies. This may include using gravity, as Colgate does, to "power" toothpaste

tubes or lotions, or using green plants to filter indoor air pollutants. This may also include generating renewable sources of power, such as solar, wind, hydroelectric, or geothermal.

Solar power charges a host of devices ranging from \$4 pocket calculators to \$10,000 home-energy systems, now used in more than one million U.S. homes. The market for solar-powered appliances and photovoltaic home-energy systems is estimated at \$1.5 billion in the United States and has grown 20 percent each year since 1992. Add in biomass, wind, geothermal, and other renewable energy technologies, and the market grows to \$3.5 billion.<sup>13</sup> Many utilities, like Traverse City Light and Power, creators of an innovative "Green Rate" wind program, are beginning to notice the possibilities.



### Case Study

#### The Coming Age of Renewable Power

"Green pricing" is catching on at electric power utilities across the nation. This refers to programs through which customers voluntarily pay a premium for electricity generated by renewable resources. Traverse City Light and Power, a municipal utility in Michigan, offers one of the most successful of such programs.

Under the plan, called "Green Rate," customers pay a 1.5¢-per-kilowatt-hour premium for wind power generated by a locally installed Vestas V-44 600-kW wind generator that towers over a local cornfield—the largest operating turbine in the United States.

Customers also agree to buy their electricity for a specific number of years—three years for residential, ten years for commercial customers. Customers are rewarded with locked-in rates—a benefit that can be offered since wind power is not subject to variable fuel costs. To date, 20 commercial customers and 245 residential customers (representing about 3 percent of the utility's patronage)

have signed on despite the 17–23 percent premium, depending upon the rate class.<sup>14</sup>

To generate this kind of innovative thinking in your own company, start with some of the techniques used in the Getting to Zero<sup>SM</sup> process.<sup>15</sup> Distill the essence of your product's or package's function and ask: How would Mother Nature do it? Ask: How does nature protect things? Transport seeds? Get rid of waste? Communicate? Ask: What are some things in nature that are *like* our product or package? Search for some metaphors like banana peels and pea pods that can catalyze creativity. Ask: What would we do differently if, as in nature, landfills were not an option?

The next time you want to brainstorm, take your team to the woods instead of a sterile hotel room. Send your colleagues outdoors in search of innovative natural products and packages that are compatible with Earth. Take along some ecologists and biologists.

When taking these steps, keep in mind that using natural prototypes will not only accelerate your thinking, but it can shave light-years off your test market. After all, Mother Nature has been testing her concepts for over four billion years!

## IDEAS FOR ACTION

Ask the following questions to uncover opportunities for innovative and pro-active product greening:

- What would it take for our product/industry to exist in a sustainable society? How could we deliver the same product benefits with zero environmental impact?
- Are there opportunities to offer variations in our product to cater to regional differences in climate, topography, and/or after-use/disposal options?

- Do consumers know how best to use our product so as to minimize environmental impact?
- How do consumers use our products? How can we alter our products to better match their needs and habits and still minimize environmental impact?
- Is the mass market ready for our eco-innovation? Should we pursue a niche distribution strategy?
- How do consumers view our products? Have their assumptions about what is environmentally correct for our product or category changed? What are their current expectations?
- What opportunities exist to impact the entire system of design, manufacturing, distribution, and reuse/disposal in which our product is made? Where are the opportunities to make the biggest environmentally oriented contribution?
- What would we have to do differently in order to achieve zero environmental impact?
- What are the opportunities to offer services as an adjunct or replacement to our products?
  - Can we extend the life of our own or another company's products through technical assistance, repair, maintenance, and/or disposal services?
  - Can we lease our products or make them available for paid sharing by a number of customers?
  - Can we offer the service replacement of our product, e.g., lawn-mowing service as opposed to selling lawnmowers?
  - What are our opportunities to offer information or electronic-based substitutes for material products?
- How can we harness the power of nature as inspiration for green product and service development?
  - Are all of our employees trained in the basic principles of ecology?

— Can we provide opportunities for our employees to interact with nature and professionals—such as ecologists and biologists—who can stimulate their thinking? (Note: See Chapter 9 for a discussion of The Natural Step employee environmental awareness program.)

## Notes

1. "Sustainable Product-Services Development," introductory notes presented by Ezio Manzini at the Pioneer Industries on Sustainable Services workshop organized by the United Nations Environmental Programme—Working Group on Sustainable Product Development at the International Natural Engineers and Scientists Conference, "Challenges of Sustainable Development," Amsterdam, August 22–25, 1996.
2. Young, John, "The New Materialism: a Matter of Policy," *World Watch*, September/October 1994, p. 31.
3. Tierney, John, "Recycling Is Garbage," *New York Times Magazine*, June 30, 1996, p. 44.
4. Canning, Christine, "The Laundry Detergent Market," *Household and Personal Products Industry*, April 1996, p. 76.
5. "Juvenile Lunch Kits from Rubbermaid Bring Fun to Everyday Lunches," Rubbermaid press release, July 1996, p. 1.
6. United Nations Environmental Program—Working Group on Sustainable Product Development, correspondence to members, January 23, 1997.
7. Brookhart, Beth, "Cotton's Little Red Hen," *Farm Journal*, 1991, p. 8.
8. "Organic Cotton Hits the Shelves," *In Business*, Volume 16, Number 3, May/June 1994, p. 21.
9. Davis, John Bremer, "Product Stewardship and the Coming Age of Takeback: What Your Company Can Learn from the Electronics Industry's Experience," Cutter Information Corp., Arlington, Massachusetts, 1996, p. 38 and p. 108.
10. *Ibid.*, p. 39.
11. *BioCycle*, December 1993, p. 26.
12. John Deere Lawn and Grounds Care Division press release, 1996, p. 4.
13. Personal communication with Scott Sklar, executive director, Solar Energy Industries Association, May 28, 1997.
14. Telephone conversation with Steve Smiley, Bay Energy Services, February 18, 1997; and *Green Pricing Newsletter*, Ed Holt, ed., "The Regulatory Assistance Project Number 3, April 1996.
15. Getting to Zero is a service mark of J. Ottman Consulting, Inc.