



# — THE CIRCULAR ECONOMY —

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# THE CIRCULAR ECONOMY

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**A note to readers:** To make the report easy to navigate, we've added hyperlinks to this page, so you can jump immediately to the items that most interest you (or, alternatively, you can read the material straight through).

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# THE CIRCULAR ECONOMY

## EXECUTIVE SUMMARY

Among some of the world's top corporate leaders, there's a growing understanding that traditional business models—built on the presumption of unlimited and cheap natural resources—must be reworked for 21st century realities. The alternative model that's taking shape represents a substantial departure from the “take, make and dispose” mindset: The circular economy envisions a smarter, more restorative way to create, use and dispose of products that designs out waste.

This framework weaves together emerging practices like collaborative consumption and older ideas like recycling and remanufacturing. The overall idea isn't new but is rapidly gaining traction thanks to bottom-line considerations—spiking commodity prices coupled with looming shortages of many natural resources—along with encouragement from governments, tech tools that enable new approaches and changing consumer attitudes.

While the shift to a fully circular system is complex, brands across categories are taking steps toward implementing it by rethinking various elements of the status quo: leasing rather than selling products, remanufacturing goods, seeking ways to extend the life of products or their components, finding more value in waste, or designing for circular use. Brands are catalyzing existing behaviors, such as selling secondhand products and repairing worn goods, and embracing newer concepts, like car-sharing.

The circular economy represents a markedly different way of doing business, forcing companies to rethink everything from the way they design and manufacture products to their relationships with customers. Ultimately, this model is both far better for the planet and important for long-term competitiveness. Says McKinsey managing director Dominic Barton: “This is not CSR or a sideshow, but is fundamental.”

## METHODOLOGY

Our trend reports are the result of quantitative, qualitative and desk research conducted by JWTIntelligence throughout the year. For this report, we also interviewed several experts and influencers in the circular economy.\*



JAMIE BUTTERWORTH,  
CEO, Ellen MacArthur  
Foundation



KYLE WIENS,  
co-founder and CEO, iFixit



STEFAN SEIDEL,  
deputy head, Puma SAFE  
Global; team head, Puma SAFE  
Ecology

\*See Appendix to learn more about these experts.



## — DEFINING THE CIRCULAR ECONOMY —

The vision: a smarter, more regenerative and restorative way to create, use and dispose of products that designs out waste from this cycle. An alternative to the “take, make and dispose” model that predominates today, the circular economy is an old concept that’s steadily gaining ground among influential entities and corporations.

# DEFINING THE CIRCULAR ECONOMY

Academics, thought leaders and select businesses started advocating for a more circular economy in the 1970s, but until fairly recently it remained a fringe idea. Today, backers include McKinsey & Co. and the World Economic Forum, while Unilever, Cisco Systems and Philips are among the multinationals implementing circular concepts. The Ellen MacArthur Foundation, a nonprofit advocating for the circular economy, has launched Project MainStream to help companies transition their materials management, information technology and business models.

The circular economy provides a framework that weaves together new practices, such as collaborative consumption, and older ideas like recycling so that businesses and consumers alike can adopt a new approach.

## Key Principles of the Circular Economy

*Adapted from the Ellen MacArthur Foundation*

- Design out waste.
- Understand that everything within the economy has value.
- Design with disassembly and reuse in mind, with minimal changes required to reuse components of a product.
- Differentiate between consumable and durable components. Biological materials go back into nature; durable, or technological, materials stay in use for as long as possible.
- Find ways to reuse materials across the value chain. (For instance, Nike uses recycled plastic bottles in its polyester products.)
- Eliminate toxic chemicals, making it easier to reuse components without risk of contamination.
- Fuel the system with renewable energy.
- Build resilience through diversity.
- Adjust prices to reflect the true cost of the effort required to produce a product.
- Think in systems, taking into account how one action will impact the whole.

### LINEAR VS. CIRCULAR ECONOMY

In today's linear system, manufacturers typically take resources from the earth to make products that are soon discarded in landfills. (In other words, "take, make and dispose.") The negative environmental impact is clear. At the same time, there are disadvantages for businesses. Variable resource costs and supply chain disruptions expose companies to risk, and they can't extract the embedded costs of labor and materials at the end of a product's lifecycle.

According to McKinsey, each year around 80% of the \$3.2 trillion worth of materials used in consumer goods are not recovered.

A circular economy, by contrast, "seeks to rebuild capital, whether this is financial, manufactured, human, social or natural," as the Ellen MacArthur Foundation explains. Under this model, the production of goods operates like systems in nature, where the waste and demise of a substance becomes the food and source of growth for something new.

# DEFINING THE CIRCULAR ECONOMY

## LINEAR VS. CIRCULAR ECONOMY (cont'd.)

In a circular economy, those materials that can safely be returned into the biosphere—thus generating more raw materials for the future—are categorized as biological. Everything else is termed technological and designed to remain in use for as long as possible. Durable goods are used until they're no longer functional, while consumable goods are produced and used with less waste and then "cascaded" to different uses. (For instance, Nike runs a program in which old shoes become the raw material for running tracks.)

The ultimate goal is closed-loop design: products that are "more good" rather than "less bad" and, from creation to disposal, are holistic or regenerative for the production system as a whole. Chemist Michael Braungart and sustainable design leader William McDonough have trademarked and popularized the concept of Cradle to Cradle design,

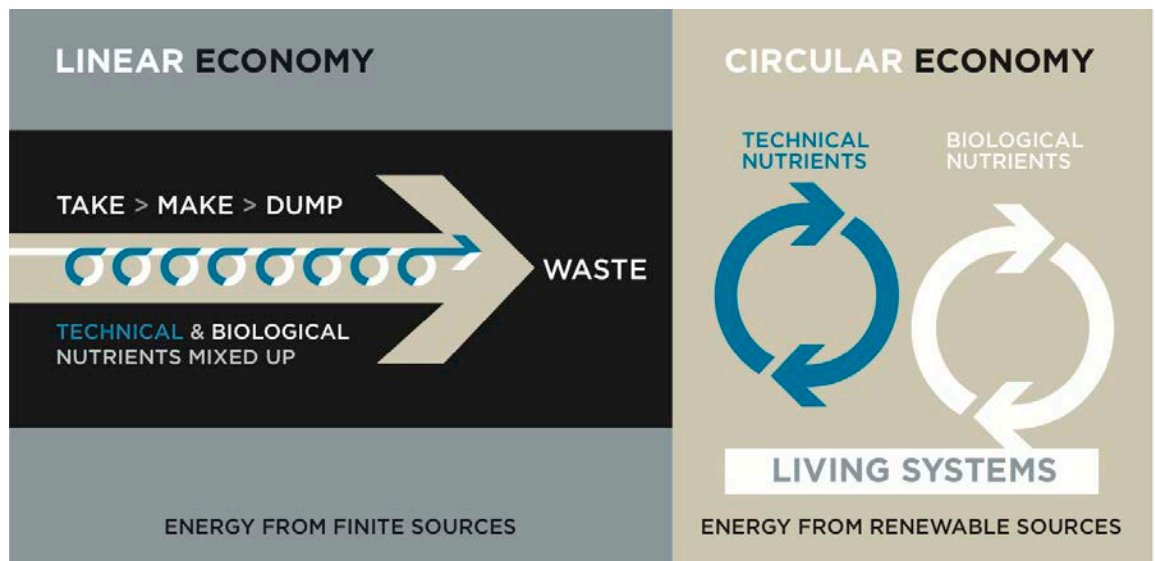
a benchmark that provides a framework for businesses to achieve this goal. Brands including Puma, Method and Aveda have had products certified as Cradle to Cradle.



There are reasons the linear model of production established itself so strongly over

the last century. Where resource prices are low and there are few penalties on hard-to-dispose waste, this might still be the superior answer. But the markets where this assumption still holds are getting fewer."

—MARTIN STUCHTEY, director, McKinsey's Sustainability & Resource Productivity Practice, "Questions and answers on the circular economy," McKinsey on Society, October 2013



# DEFINING THE CIRCULAR ECONOMY



“From a business and common sense point of view, it does not seem to make sense to grow cotton using large amounts of water, fertilizer and pesticides; go through complex ginning, spinning and weaving processes that require energy usage; and then pay for the disposal of the cotton at a landfill, where the material has no use other than filling up landfill space.” —STEFAN SEIDEL, deputy head, Puma SAFE Global; team head, Puma SAFE Ecology

## CIRCULAR BENEFITS

In a circular economy, manufacturers create more value from each unit of resource. Since products are designed with the goal of maximizing reuse, greater value is derived from the initial labor, material and capital costs. “The circular economy is a means of allowing businesses to decouple future economic growth from resource constraints,” explains Jamie Butterworth, CEO of the Ellen MacArthur Foundation.

Rising commodity and energy prices are a major motivation behind the shift. Advocates also say the shift to a circular system would significantly lower costs and help to create jobs. The consumer goods sector alone would save as much as \$700 billion annually by applying circular principles to current business models, per the Ellen MacArthur Foundation. And a report by the World Economic Forum and

the Ellen MacArthur Foundation argues that a shift to the circular economy could provide \$1 trillion in annual savings for the global economy by 2025.

The Ellen MacArthur Foundation sees the potential for 100,000 new jobs globally within five years of a shift to the circular economy, with employment opening up in the areas of remanufacturing and recycling. Advocates envision a revitalization of cities such as Detroit that were built on manufacturing for the linear economy. Already some regional governments in Scotland, Denmark and Belgium are tapping into the potential of job creation around recycling and downcycling products. There’s also the potential for new industries built around specialties such as repair and new forms of waste management logistics.



“Like all major transitions in human history, the shift from a linear to a circular economy will be a tumultuous one. It will feature pioneers and naysayers, victories and setbacks. But, if businesses, governments and consumers each do their part, the Circular Revolution will put the global economy on a path of sustainable long-term growth—and, 500 years from now, people will look back at it as a revolution of Copernican proportions.”

—FRANS VAN HOUTEN, CEO, Royal Philips, “The circular revolution,” Project Syndicate, Jan. 21, 2014



## — TREND DRIVERS —

The circular economy is a concept dating back more than 30 years, so why is it getting attention and adoption now? For businesses, the chief reasons are practical (depletion of key natural resources, rising commodity costs) and technological (new tools make circular principles easier to implement). Meanwhile, more governments are getting behind the idea, and people are embracing new ways of consuming.



## Looming resource shortages

McKinsey estimates that by 2030, an additional 3 billion people will ascend to the middle class, the largest jump ever. These consumers will only increase the squeeze on our finite supplies of energy, materials, food and water.

With demand for resources growing exponentially, experts are sounding warnings about looming shortages. Reserves of key elements such as gold, silver, indium, iridium and tungsten could be depleted within 50 years. And the planet will start running out of arable surfaces as demand grows for cotton and edible crops. It's becoming imperative to rethink how goods are produced and recycled.

## Skyrocketing commodity and energy costs

Businesses have been hit by massive increases in commodity prices, which shot up 150% between 2002 and 2010, negating the real price declines of the past 100 years. And demand for energy is surging, especially among newly industrialized nations. According to a 2013 report by the U.S. Energy Information Administration, world energy consumption is expected to increase by 56% between 2010 and 2040.

## Better technology

Thanks to the emerging Internet of Things and big data tools, it's getting much easier for manufacturers to see value that was once invisible in the supply chain. With RFID chips and GPS, for instance, companies

can readily track parts over their lifecycle—instantly seeing where a product or part is, the condition it's in, its origin and what it's made from. This greatly simplifies processes that recycle, reuse or remanufacture goods. GM cites a system that electronically tracks byproducts as a key element in the company's ability to recover the highest possible value from manufacturing waste.

Meanwhile, design capabilities are evolving quickly with advances in production, materials science and manufacturing (such as 3D printing).

## Urbanization

Currently about half the world's population lives in cities, and this will rise to 6 in 10 by 2030, according to World Health Organization estimates. More dense populations help to enable the circular model: Urban areas can host cost-effective and high-quality collection systems for goods ready to be returned to the circular loop, as well as asset-sharing schemes (such as car shares) and systems for cleaning and repairing used products prior to redistribution.

## Government pressures

Governments and regulators are taking up legislation that would support the shift to a circular economy. The European Union and Japan are among the nations that have enacted strong laws pushing recycling and waste management. Food waste is a noted area of focus. In Massachusetts, for example, businesses that produce more than

one ton of food waste per week will be banned from sending it to landfills as of October.

## New consumer notions of value and materialism

The global economic downturn greatly tempered the "Spend now, think later" mindset. Today's consumer tends to be more mindful about consumption, looking for just enough and better, more durable options. People have also become more conscious of the impact their everyday consumption has on the environment and society. They're looking for ways to mediate their material desires with an aim to do more good in the world.

## Access over ownership

In a circular system, companies may own products that are shared, rented or leased, meaning that fewer goods need be made. Today consumers are warming to the idea of borrowing/renting goods instead of purchasing them, from cars to dresses. It's easier than ever to get access to what one wants or needs without having to buy it outright.

EIGHTY-TWO  
BILLION  
TONS OF RAW  
MATERIAL  
FORECAST TO ENTER  
THE ECONOMIC  
SYSTEM BY 2020\*



## — HOW BRANDS ARE BECOMING MORE CIRCULAR —

The shift to a fully circular system is complex, but many brands are taking steps toward this vision by rethinking elements of the status quo: instituting new ways for customers to use goods, seeking ways to extend the life of goods or their components, finding value in waste, or designing for more circular use. In some cases this involves catalyzing existing behaviors such as selling secondhand products or repairing worn goods, while in others it means embracing new concepts, like car-sharing.

# HOW BRANDS ARE BECOMING MORE CIRCULAR

## SELLING TEMPORARY OWNERSHIP

Businesses are extending the concept of leasing into new categories, shifting from selling products to selling services. Automakers that adopt this idea, for instance, are selling mobility by providing easy, short-term access to cars when people need them. A key benefit for manufacturers is that the raw materials used to produce their goods can remain corporate assets. This model provides more incentive to create products that are highly efficient and durable.

**Automakers' car-sharing programs:** Some automakers are mimicking the Zipcar model, providing short-term rentals for people who don't own cars. Daimler's car2go rental scheme launched in Germany in 2008 and now operates in 28 cities across North America and Europe. BMW's 3-year-old DriveNow operates in San Francisco and several cities in Germany, and claims 215,000 customers. Last year, Ford of Germany announced plans for a Ford2Go program.



**Mobile operators leasing phones:** The EU's Waste Electrical and Electronic Equipment Directive, which went into effect in 2005 and has since been amended and revised, requires companies to return materials to the industrial supply chain. To meet this directive, some European mobile operators are adopting leasing models.

Vodafone's Red Hot upgrade plan, which launched in the U.K. in 2012, is positioned as a means of providing customers with faster access to the latest smartphones. Customers sign a two-year contract with the option to upgrade the rented phone after a year if they return it in good condition. Similarly, since 2011, O2 has offered a plan that lets customers lease a phone for one year and then upgrade to a new one without paying upfront.

## Upgrade every year with new Vodafone Red Hot

Grab our hottest phones, cut out the waiting

Upgrade 12 months early on our new Red Hot plans.

[More about new Vodafone Red Hot](#) ▶

## SELLING TEMPORARY OWNERSHIP (cont'd.)

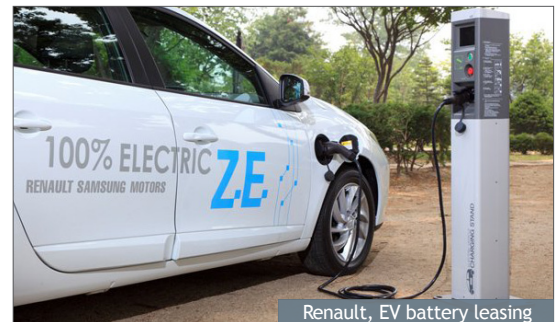
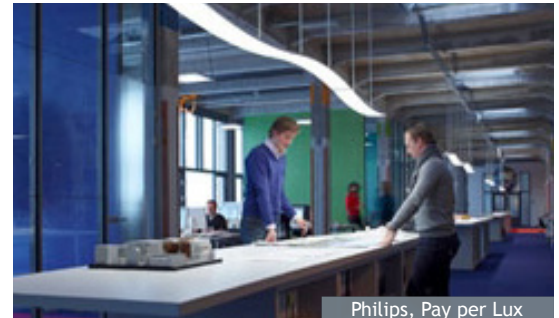
**Philips, Pay per Lux:** Prompted by a commission from a sustainability-focused architectural firm, Philips began experimenting with a “new and more abstract way of delivering light” that allowed its client to purchase the exact amount of light needed for specific tasks rather than simply buying hardware such as lamps and cables. Philips is now working with municipalities to implement the “lighting as a service” model on a larger scale.

For cities looking to switch to LED systems, Philips pays the upfront costs of installation and equipment, then gets compensated through a performance contract. For example, the company is currently upgrading 13,000 lighting fixtures in Washington, D.C.; the city will pay Philips using the savings gleaned from more efficient bulbs and processes (the bulbs will adjust their brightness based on available natural light).

**Renault, EV battery leasing:** Renault, a company that’s deeply involved in the circular economy, was the first European carmaker to introduce the idea of requiring electric vehicle owners to lease the car battery for a monthly fee. Renault says this system “helps retain the residual value of electric vehicles and makes the batteries traceable for later reengineering or recycling,” according to an *IndustryWeek* report. It also helps to bring down the cost of EVs.

**Carpet-leasing programs:** Atlanta-based Interface carpets has been leasing carpet tiles to commercial institutions since 1995. Within a year of adopting this model, sales grew from \$800 million to \$1 billion, and the company cut the amount of raw materials consumed by approximately 20% per dollar of sales.

Desso, a Dutch carpet manufacturer, makes fully recyclable EcoBase carpet tiles. Companies lease these tiles for eight to 10 years before returning them to Desso. The firm has been participating in the circular economy for six years and aims to have all its products certified under the Cradle to Cradle label by 2020.



The idea is to become a service industry, relying on a leasing system. Then you don’t buy the product, you only pay for its use, which means materials remain our responsibility. And, of course, it’s not in our interest to see them wasted. At the end, everybody wins.”

—STEF KRANENDIJK, former CEO of Desso, Ellen MacArthur Foundation case studies, Sept. 14, 2010

# HOW BRANDS ARE BECOMING MORE CIRCULAR

## SELLING TEMPORARY OWNERSHIP (cont'd.)

**Mud Jeans:** With its leasing scheme for jeans, this Dutch company “represents a new consuming philosophy that is about using instead of owning,” according to Mud’s website. The concept also protects the company from volatile cotton prices. Consumers pay €5.95 a month for a pair of jeans; after a year, they can return the jeans to Mud, trade them for a new pair and start another yearlong lease, or switch to a four-month lease. Mud is responsible for any repairs during the lease period.



## FACILITATING SECONDHAND SALES

One of the easiest ways to eliminate waste is to give goods new life in the secondhand market without recycling or remanufacturing. With consumers looking for bargains, the secondhand market has been flourishing around the globe. Smart brands are facilitating the resale of their goods, turning a practice that’s already underway into a brand-building experience.

**Patagonia:** The company has numerous initiatives designed to make it a more circular business. As part of the Common Threads Initiative, launched in 2011, Patagonia strives to help customers use their goods for a long time, repair what breaks, reuse or resell goods they no longer want and recycle items that have outlasted their usability. To facilitate secondhand sales, Patagonia set up the first multi-seller branded store on eBay; consumers who take the Common Threads pledge can sell in this store and have their gear listed on Patagonia.com’s “Used Gear” section. And in a trial program running in four stores, customers can trade in old Patagonia gear for store credit. These items are sold in a “Worn Wear” section of the store.



Some Patagonia stores sell customers' used gear

# HOW BRANDS ARE BECOMING MORE CIRCULAR

## FACILITATING SECONDHAND SALES (cont'd.)

**Ikea:** In 2010, Ikea Sweden created a website for customers who wanted to sell their used Ikea furniture. In 2013, the company expanded on this idea with ads that featured only secondhand goods. Ikea asked 50 people who were looking to buy new Ikea furniture if it could help sell their old items. Ikea then collected the goods and showcased them in a two-month campaign backed by a budget equivalent to that of a new product launch. Additionally, Ikea turned its Facebook page into a digital flea market every Sunday so buyers and sellers could exchange Ikea goods.



In Sweden, an Ikea campaign advertised used goods from the chain

### **Marks & Spencer and Oxfam, “Shwopping”:**

To give old clothing extra life, British department store Marks & Spencer has been partnering with Oxfam on an initiative dubbed “Shwopping.” Customers can drop off unwanted clothing at Oxfam outlets for £5 credit at M&S stores or bring old garments to M&S. The clothing is then resold, reused or recycled, keeping it out of landfills. Marks & Spencer says that 7.7 million garments have been collected since 2012. The company’s ultimate goal is to recycle as many textiles as it sells.



Marks & Spencer shoppers can drop off old clothes for Oxfam

# HOW BRANDS ARE BECOMING MORE CIRCULAR

## FACILITATING PRODUCT REPAIR

In a circular economy, broken goods are repaired and used for as long as possible rather than thoughtlessly tossed out. Some companies are empowering consumers with the information, tools and replacement parts to fix their products, and also designing goods to make the repair process easier. Handles on Patagonia's Freewheeler luggage, for instance, have four red screws holding them in place, making it simple for customers trying to repair jammed or broken handles to see which parts to unscrew.

This approach appeals to budget-conscious, DIY-minded and/or environmentally concerned consumers. In a survey by crowdsourced repair site iFixit, respondents said they're more likely to become a repeat customer once they have successfully repaired a manufacturer's product.

**Partnering with iFixit:** DIY-minded consumers looking to repair broken products have plenty of help at their disposal thanks to Wikipedia-style communities such as iFixit, a crowdsourced resource that teaches some 3 million users a month how to mend anything from broken zippers to iPhone screens.

Through a partnership with iFixit, Patagonia provides detailed guides for repairing and caring for apparel items, luggage and fasteners. Timbuk2, an American company that makes messenger bags, posts videos to iFixit that explain how to fix broken bags. (Alternatively, customers can send bags to Timbuk2's factory for complimentary repair.)

**Offering consumer repair kits:** Dell and Lenovo are among the consumer electronics companies that make it easy for customers to replace parts on their own. Dell designs certain computer components for easy removal and replacement; these are labeled Customer Self Replaceable and shipped to customers in need, along with instructions. Similarly, Lenovo products feature Customer Replaceable Units.



What's interesting about [the repair movement] is that the circular

economy is happening around these companies' products whether they're participating or not."

—KYLE WIENS, co-founder and CEO, iFixit

**REPAIR MANIFESTO**  
WE HOLD THESE TRUTHS TO BE SELF-EVIDENT

**IF YOU CAN'T FIX IT, YOU DON'T OWN IT.**

**REPAIR IS BETTER THAN RECYCLING**  
Making our things last longer is both more efficient and more cost-effective than mining them for raw materials.

**REPAIR SAVES YOU MONEY**  
Fixing things is often free, and usually cheaper than replacing them. Doing the repair yourself saves you money.

**REPAIR TEACHES ENGINEERING**  
The best way to find out how something works is to take it apart.

**REPAIR SAVES THE PLANET**  
Earth has limited resources. Eventually we will run out. The best way to be efficient is to reuse what we already have.

**REPAIR CONNECTS PEOPLE AND THINGS** | **REPAIR IS WAR ON ENTROPY** | **REPAIR IS SUSTAINABLE**

**WE HAVE THE RIGHT:**

- TO DEVICES THAT CAN BE OPENED
- TO REPAIR DOCUMENTATION FOR EVERYTHING
- TO REPAIR THINGS IN THE PRIVACY OF OUR OWN HOMES

**TO CHOOSE OUR OWN REPAIR TECHNICIAN** | **TO NON-PROPRIETARY FASTENERS**

- TO REMOVE 'DO NOT REMOVE' STICKERS
- TO REPLACE ANY & ALL CONSUMABLES OURSELVES
- TO TROUBLESHOOTING INSTRUCTIONS & FLOWCHARTS

**TO AVAILABLE, REASONABLY-PRICED SERVICE PARTS**

**BEFORE REPAIR IS INDEPENDENCE SAVES MONEY & RESOURCES** | **REQUIRES CREATIVITY** | **MAKES CONSUMERS INTO CONTRIBUTORS** | **INSPIRES PRIDE IN OWNERSHIP**

**IFIXIT**

# HOW BRANDS ARE BECOMING MORE CIRCULAR

## FINDING NEW USES FOR WASTE

More companies are evaluating their production chains to discover any points at which waste could be turned into a commodity of value. Doing so creates both a more circular business and new revenue streams. Jamie Butterworth, CEO of the Ellen MacArthur Foundation, notes that rather than employ traditional waste management firms, more businesses are seeking out resource management or reverse logistics partners in a bid to retain used materials.

**General Motors:** GM sees waste “from a systems perspective,” an approach that cuts costs and increases efficiency while also reducing environmental impact. The automaker has managed to realize \$1 billion annually in recycling and reuse revenue from its waste. The company has 110 landfill-free facilities around the world and diverted 2.6 million metric tons of waste from landfills in 2012. Among other things, GM recycles shipping waste into sound-dampening materials for cars and melts down aluminum shavings from transmission casings to create more casings.

**Procter & Gamble:** With a commitment to send zero manufacturing waste to landfills by 2020, P&G created Worth From Waste, a program it says has generated more than a billion dollars in value for the company since 2009. A Global Asset Recovery Purchases team works with external partners to identify potential uses for waste. In the U.S., scraps from the Pampers plant are used for upholstery filling; in Mexico, waste from a Charmin plant is used to make roof tiles for the local community; and garbage from a Gillette factory in the U.K. is turned into turf for commercial use.



As part of P&G's Worth From Waste program, waste from a plant in Mexico is recycled into roofing tiles for the community



# HOW BRANDS ARE BECOMING MORE CIRCULAR

## FINDING NEW USES FOR WASTE

(cont'd.)

**Starbucks:** The coffee chain is determining how to make the most of the food and coffee waste it generates. So far, Starbucks and its co-developers have applied for a patent on a cattle feed made with coffee grounds that's being used in Japan. In 2012, Starbucks Hong Kong launched a partnership with the City University of Hong Kong in hopes of creating a biorefinery that can process the company's waste into succinic acid, a key ingredient in bioplastics, detergents and medicines.

**Wildwood Brewery:** The beer brewing process is tremendously wasteful: For every 45 pounds of barley malt that go into making a barrel of beer, more than 41 pounds are discarded. This Montana-based brewery is building an integrated production system that will transform its waste into raw material for a network of industries.

**Greencup Coffee:** U.K. entrepreneur Jeremy Knight was looking for a way to turn the waste generated by Redcup, his original coffee company, from a cost (incurred in dispatching the waste to a landfill) into a commodity. In 2009 he launched corporate coffee service Greencup: Each bag of beans is delivered with a recycling container into which customers place their grounds; a Greencup Fleet collects this waste, and the company turns it into fertilizer.



Wildwood brewery in Montana is reusing barley malt and other waste



Greencup in the U.K. turns its coffee grounds into fertilizer

# HOW BRANDS ARE BECOMING MORE CIRCULAR

## COLLECTING AND RECYCLING USED GOODS

Some companies are collecting used goods directly from their customers, then giving them to charities or using the raw material to make new goods, which creates a closed-loop production cycle. Apparel provides a good example. A number of well-known retailers (including the ones below) are partnering with I:CO, a Swiss reuse and recycling firm that sets up collection points in stores for worn textiles and shoes. Customers who return used items get discounts on future purchases.

**Puma:** The Bring Me Back program, in which shoppers deposit apparel from any brand at collection points in Puma shops, launched in Germany two years ago and has expanded to 40% of the retailer's stores worldwide. Materials from these used items are used to create Puma's Cradle to Cradle-certified InCycle line of clothing.

**H&M:** Last year the fast fashion retailer kicked off a global recycling effort in tandem with I:CO that spans all markets in which H&M operates. H&M collected 7.7 million pounds of clothing last year, some of which was used to create a denim collection that went on sale earlier this year. (Twenty percent of the cotton used in these pieces is recycled, a percentage that H&M plans to increase in future collections.) The brand also launched its Conscious Collection, a line made of organic and other sustainable materials, in April.

**American Eagle Outfitters:** In June, the teen-focused retailer added I:CO collection boxes in all its North American stores, giving customers who drop off old shoes, jeans or other clothing a \$5 credit toward its AEO jeans. Any proceeds gleaned from the program will be donated to the Student Conservation Association.



An H&M denim collection incorporated recycled textiles



For us, this is a clear long-term business case to keep on being profitable. ... We will have to find ways of being less dependent on natural resources.”

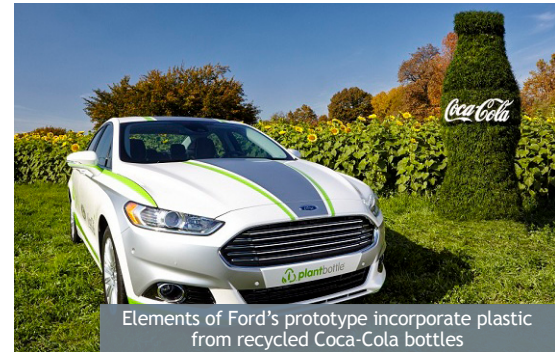
—HELENA HELMERSSON, H&M head of sustainability, “H&M reiterates support for circular economy,” EdieWaste.net, March 4, 2014

# HOW BRANDS ARE BECOMING MORE CIRCULAR

## RECYCLING GOODS VIA PARTNERSHIPS

Many companies won't be able to reuse their own waste or used goods, but can give these materials new life thanks to symbiotic partnerships.

**Ford and Coca-Cola:** Late last year, Ford and Coca-Cola unveiled a prototype Ford Fusion Energi hybrid vehicle that featured cushions, door panel inserts and other components made with a fiber that uses recycled plastic Coke bottles. The collaboration marked the first time Coke applied its PlantBottle Technology beyond PET packaging. The car also used sound-absorbing denim material in the carpet liner and a soybean base in the seat cushions.



Elements of Ford's prototype incorporate plastic from recycled Coca-Cola bottles

**Ford and Heinz:** More recently, Ford announced another unconventional partnership: As H.J. Heinz Co. seeks ideas for reusing the discarded peels, stems and seeds from the tomatoes it uses to make ketchup, Ford is researching ways it might use tomato fibers to create a strong but lightweight sustainable material for car components.



Puma's Re-Cut shoes use scraps from a denim manufacturer

**Puma and Saitex:** Puma is partnering with Saitex, a Vietnamese denim manufacturer, for its Re-Cut shoes. The line, which debuted earlier this year, is made from Saitex's post-industrial scraps; Re-Cut profits are donated to a Vietnamese orphanage.

## REMANUFACTURING GOODS

Engines and electronics lend themselves to remanufacturing—that is, replacing obsolete or worn-out portions of a product with new ones, then reintroducing the product into the market. But with goods designed for a linear economy, remanufacturing can be challenging. Most electronics are not designed for easy dismantle and repair, and reverse logistics are difficult to calculate. But some companies have been doing it for years, providing a model for those newly interested in the idea.

**Renault:** The French automaker has grown its remanufacturing business into a €200 million operation, sparking interest among companies including Jaguar Land Rover and Toyota, which are both experimenting with remanufacturing projects. Renault first opened an engine remanufacturing facility in 1949 and today remanufactures injection pumps, gearboxes, injectors and turbocompressors, all of which are used for vehicle repairs.

Remanufacturing parts is 30-50% less expensive than producing new parts, according to Renault, in part because the process uses a fraction of the energy, water and chemicals required; in addition, it generates 70% less waste than producing a new part.

# HOW BRANDS ARE BECOMING MORE CIRCULAR

## REMANUFACTURING GOODS (cont'd.)

**Caterpillar:** Since 65% of Caterpillar's costs are in materials, the company's business model is built around recovering materials for remanufacturing. Caterpillar has been remanufacturing components of its machinery since the 1970s and now operates nine remanufacturing sites worldwide. The company's Product Link service lets it digitally monitor the health of parts in use, which helps to lower owning and operating costs while simplifying the reverse logistics process.

**Ricoh:** This Japanese company, considered a global leader in the circular economy, has been remanufacturing its copy machines since 1994. When leased products are returned, Ricoh inspects and dismantles them so that certain parts can be upgraded. Ricoh then re-enters the machines into the market with the same warranty as a new product. Ricoh is aiming to cut its use of new resources by 25% by 2020 vs. 2007 levels, and by 87.5% by 2050.

## DESIGNING FOR CIRCULAR USE

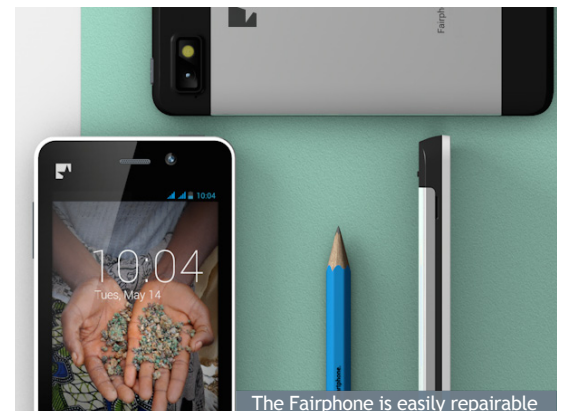
Some brands are going back to the drawing board, using a new set of criteria to design goods that involve much less waste than traditional products. The ultimate goal is a closed loop in which every aspect of a product's existence, from creation to disposal, is accounted for.

**Google, Project Ara and ZTE, Eco-Mobius:** Smartphones can quickly become obsolete, but generally only because a few features are outdated. Google is working on a phone, dubbed Project Ara, made up of modules that customers would swap out when new, improved components are available. The phone is scheduled for release in 2015. ZTE showed its similar Eco-Mobius concept phone at this year's Consumer Electronics Show.



Project Ara proposes a modular phone design

**Fairphone:** This Dutch startup makes an Android smartphone that uses only conflict-free minerals and is easily repairable (the company sells spare parts online). A portion of Fairphone's \$450 cost facilitates e-waste recycling and reuse via a partnership with Closing the Loop, a foundation that sponsors recycling programs in Ghana and elsewhere. Fairphone sold its first batch of 25,000 phones in 2013, and a second, bigger batch went on sale in May.



The Fairphone is easily repairable

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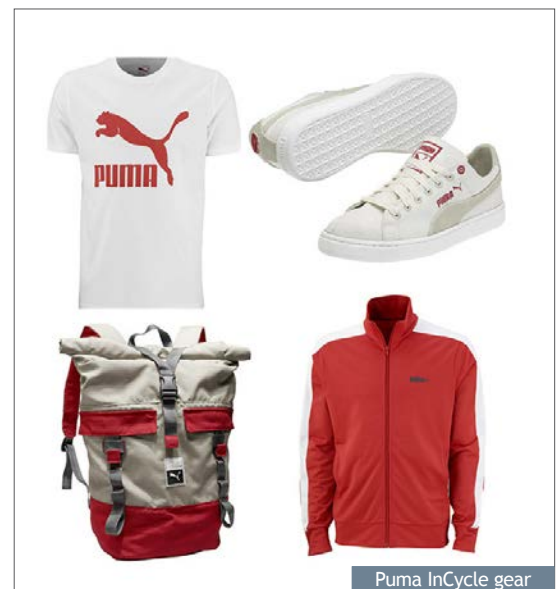
(cont'd.)

**Puma, InCycle:** A 2010 evaluation showed Puma that its biggest environmental impact is in the sourcing of raw materials. The company responded with the InCycle line of footwear, clothing and accessories, which launched in 2013. The products are manufactured in a closed-loop system, with any waste generated during production returned for reuse; they are also biodegradable or recyclable.

The line is Cradle to Cradle certified, a designation created by sustainability leaders Michael Braungart and William McDonough that carries requirements in line with the circular model.



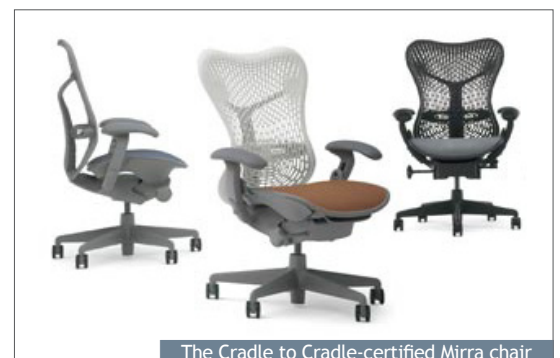
Dockers' Wellthread label



Puma InCycle gear

**Dockers, Wellthread:** Dockers, the Levi Strauss-owned men's brand, is now selling a small capsule collection that's sustainably produced and built to last and to be recycled. Pants feature reinforced buttonholes and pockets and a hook to encourage line drying. The fabric is made of a long-staple yarn designed to weather the eventual recycling process. In addition, the manufacturing process uses less water and energy than conventional methods. Wellthread launched last year.

**Herman Miller:** In the late 1990s, this furniture company began a collaboration with William McDonough to incorporate Cradle to Cradle design in the Mirra chair. The redesign included increasing recycled content, eliminating all polyvinyl chloride components and ensuring the chair could be quickly deconstructed using everyday tools. Today Herman Miller offers 23 Cradle to Cradle-certified products, ranging from desks to storage units.



The Cradle to Cradle-certified Mirra chair

# HOW BRANDS ARE BECOMING MORE CIRCULAR

## DESIGNING FOR CIRCULAR USE

(cont'd.)

**Carlsberg Circular Community:** Earlier this year, this Danish brewery formed the Carlsberg Circular Community, bringing together its supply companies in a bid to create packaging that's optimized for recycling and reuse while retaining or improving on the quality of current packaging. The company aims to have at least 15 partners and three Cradle to Cradle-certified products by 2016. New products will be assessed to ascertain whether they contain any chemicals or additives that affect the potential for upcycling.

**DIRTT Environmental Solutions:** DIRTT, which creates customizable architectural interiors, stands for Doing It Right This Time—because, as the Canadian company explains, “last time with conventional construction, the computer power didn't exist to go from design to real-time 3D to specifications to the production floor. Last time environmental sustainability wasn't tied to the bottom line. Last time there was no such thing as being able to affordably manufacture individualized spaces.”

Traditional methods of construction and demolition generate waste and often release toxic substances into the environment. DIRTT

uses 3D software methods to create modular interiors that are easily installed and can be readily reconfigured as the customer's needs evolve. Just under 10 years old, DIRTT has reached \$140 million in sales and caters to high-profile clients such as Google and eBay.

**Method:** Method's entire line of personal care and home care products is Cradle to Cradle certified. The company uses plant-based ingredients and 100% recycled plastic, explaining that it plans for “maximum material reutilization” rather than designing products that end up in a landfill.



## Reshaping the Recycling Industry

With more companies looking to keep their waste out of landfills, an array of businesses are focusing on creative ways to recycle—demonstrating that nearly anyone’s trash can become another’s treasure and helping to drive the transition to a circular system.

**Attero:** There’s a tremendous opportunity to extract valuable metals from the growing tons of electronic waste (discarded computers and mobile phones, televisions, appliances, etc.). India-based Attero, launched in 2008, uses a pioneering recycling method to efficiently process 500 tons of waste per month. The company has been doubling in size from year to year, with estimated revenue of \$27 million in 2013. Attero customers include some of the biggest electronics brands in India, such as Xerox and Epson.



**EcoScraps:** A four-year-old American company, EcoScraps collects food waste from restaurants, schools, supermarkets and elsewhere, creating garden products rich in organic nutrients. Last year the company struck its first nationwide distribution deal, with Target.

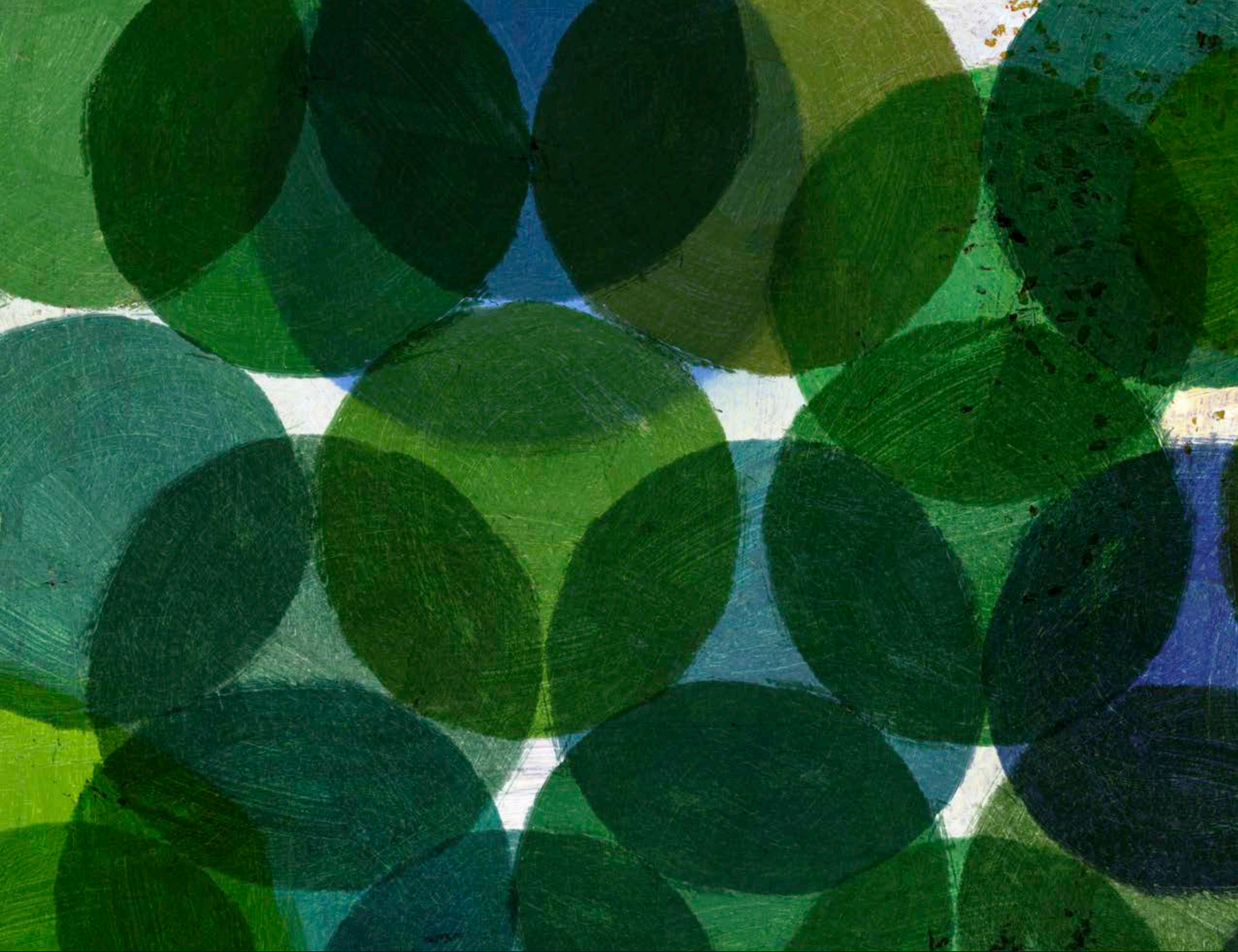
**ReGrained:** This small San Francisco company takes the “spent” grain from the beer brewing process and converts it into high-fiber granola bars. Noting that only about 10% of the ingredients that breweries use make it into the finished product, ReGrained repurposes barley and hops into products like Honey Almond IPA bars and encourages consumers to “eat beer.”

**SugaRich:** This British company recycles surplus food from factories and supermarkets into high-protein animal feed. The company is more than 50 years old but has grown by 40% over the past three years. SugaRich currently processes around 500,000 tons of waste annually and recorded £101 million in revenue in 2013.

**TerraCycle:** Founded in 2001 by a Princeton undergrad, TerraCycle collects and then repurposes difficult-to-recycle packaging and products, creating new materials and products. The company works with more than 100 major brands in 23 countries, with an estimated \$20 million in sales for 2013.



TerraCycle bag made from used juice pouches



## — WHAT IT MEANS FOR BRANDS —

The circular economy represents a markedly different way of doing business, replacing established practices like planned obsolescence with new approaches to generating profits. This model forces companies to rethink everything from the way they design and manufacture products to their relationships with customers. For their part, consumers will need to adjust their habits and shed traditional ways of thinking about value, ownership and product use.



The approach is far better for the planet, but it's largely driven by business practicalities, given the earth's diminishing resources and growing consumer base. "This is not CSR or a sideshow, but is fundamental," McKinsey managing director Dominic Barton told *The Guardian*. Embracing circular economy principles can enhance a company's long-term competitiveness.

While the benefits are clear, the battle will be to effect a broad rethinking of the status quo among both businesses and consumers.



What all business leaders who support the circular economy are certain about is that the current system will at some point have to fundamentally change—and so those companies that find early solutions will have a commercial advantage.”

—JO CONFINO, chairman and editorial director of Guardian Sustainable Business, "Business leaders in Davos keen to mainstream circular economy," *The Guardian*, Jan. 27, 2014

## REDEFINE PRODUCT PERFORMANCE

In the circular economy, products are designed to be durable and/or to be easily reused, upgraded and recycled—considerations that seldom play a big role in the purchase decision today. Circular goods that are leased or reusable may require a higher outlay initially but end up cheaper over the long term. Marketers will need to explain this embedded value to price-sensitive consumers trained to focus on the cost of single-use products at point of sale.

In turn, as people gradually become accustomed to this idea and more mindful about their consumption generally, we'll see a heightened consumer focus on maximizing long-term value and on total cost of ownership.

## RETHINK DESIGN FOR CLOSED-LOOP SYSTEMS

As *The Upcycle* points out (see quote below), the circular economy requires a different approach to design—of everything from goods to manufacturing systems to urban environments—so that waste is taken out of the equation. Companies will need talent who can envision and implement new ways to design goods and processes.

Google's Project Ara, for instance, reimagines smartphones as modular systems, with outdated pieces periodically swapped out. Kyocera is designing its printers so that they can be readily disassembled, making parts easy to recycle. Other companies are making components easily fixable and providing repair kits, including Patagonia and Dell.



Human beings don't have a pollution problem; they have a design problem. If humans were to devise products, tools, furniture, homes, factories and cities more intelligently from the start, they wouldn't even need to think in terms of waste, or contamination, or scarcity.

Good design would allow for abundance, endless reuse, and pleasure.”

—MICHAEL BRAUNGART AND WILLIAM MCDONOUGH, *The Upcycle* (North Point Press, 2013)

## REFRAME THE CUSTOMER RELATIONSHIP

For many businesses, the relationship with customers ends as soon as the purchase is made. In a circular system, however, products are often essentially leased, which means that periodic customers of a brand instead become ongoing users.

Companies will need to create these extended relationships so as to keep their goods within the closed loop. The possibilities are numerous, including monitoring the quality of parts digitally, as Caterpillar does; creating financial incentives for the safe return of used goods, as several apparel retailers are doing; and giving consumers the means to easily repair or reuse goods. “Dell is not there holding your hand when you do the repair, but they want to do

everything they can to make sure you have a successful experience doing it,” notes iFixit’s Kyle Wiens.

These programs can make customers feel valued, as their participation becomes key to the success of the circular system. Companies can also crowdsource circular economy ideas from customers, further integrating them into the system.

## EDUCATE AND INSPIRE CONSUMERS

Since the circular economy represents an overhaul of the way people approach consumption, consumers will need to open up to new ideas, such as leasing goods they once owned outright or paying more for something that will ultimately last longer. There will likely be a long learning curve for some.

Brands will have to explain this new model of consumption and inspire people to participate, whether by detailing the advantages to the planet or to consumers personally. Patagonia’s Common Threads Initiative, in which the company asks customers to participate in its pact to use less and recycle more, provides an interesting model.

## EMBRACE CROSS-CATEGORY COLLABORATION

Within the circular economy, used goods can easily become the raw materials for products in another category, especially as new technologies for reuse and recycling develop. So we’ll see some previously unlikely partnerships, like the one between Ford and Coke that resulted in the Ford Fusion prototype. Collaboration helps to break down the supply chain and materials barriers that prevent the circular economy from fully taking shape.

## RETOOL THE ORGANIZATION

The circular economy will require new types of cross-department collaboration and new skill sets and specialties, such as the know-how to create reverse logistics systems. Innovative thinking will also be key. Millennials, who have come of age in a mash-up culture, are less likely to think strictly in terms of well-established, linear economy processes.



We can create innovations and technology for this circular economy. If

I do it alone, it will need much more time to scale up, which is why I am convinced of the need for business alliances, where companies can co-create new solutions, new technologies and new business models.”

—ANTOINE FRÉROT, chief executive, Veolia Environnement, “Business leaders in Davos keen to mainstream circular economy,” *The Guardian*, Jan. 27, 2014



— **APPENDIX:** —  
MORE ABOUT OUR EXPERTS AND INFLUENCERS

**MORE  
ABOUT OUR  
EXPERTS AND  
INFLUENCERS**



**JAMIE BUTTERWORTH, CEO, Ellen MacArthur Foundation**

The mission of the Ellen MacArthur Foundation is to accelerate the transition toward the circular economy. Butterworth has worked with Ellen MacArthur for more than six years, from the initial setup and launch of the foundation. He now oversees its work in business innovation, education and analysis. Previously, Butterworth managed a global distribution network for Navico AS. His interests include sailing and running, and he is a visiting business fellow of the Oxford University Smith School.



**STEFAN SEIDEL, deputy head, Puma SAFE Global; team head, Puma SAFE Ecology**

Seidel has served as deputy head of Puma's Social Accountability and Fundamental Environmental Standards group since 2010. In addition, as team head of the German company's ecology group, he is responsible for Puma's environmental standards. Seidel also represents Puma at the German Network of the U.N. Global Compact and the Sustainable Apparel Coalition. He joined Puma's SAFE team in 2001, conducting numerous compliance audits and leading sustainability projects in the EMEA region. Seidel holds an undergraduate degree in environmental engineering and a master's degree in environmental management.



**KYLE WIENS, co-founder and CEO, iFixit**

iFixit is an online repair community known for its open source repair manuals and product teardowns. Launched out of Wiens' Cal Poly college dorm room, iFixit has empowered millions of people to repair their broken goods. In 2012, Wiens started Dozuki, a software company that is revolutionizing online technical documentation for manufacturers. Wiens has testified on electronic exports before the International Trade Commission and is involved in developing global environmental standards. He also writes for *The Atlantic*, *Harvard Business Review*, *Wired* and *TreeHugger*.

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