



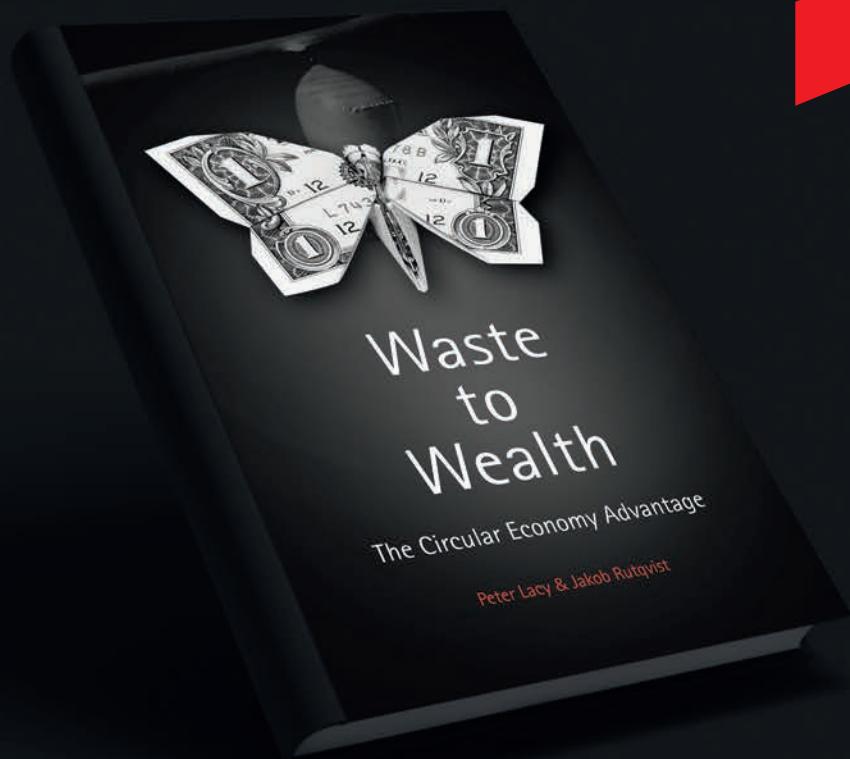
## Executive Summary

# Waste to Wealth

A book by Peter Lacy and Jakob Rutqvist

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High performance. Delivered.



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# Introduction

Transitioning to the circular economy may be the biggest revolution and opportunity for how we organize production and consumption in our global economy in 250 years. At its essence, the circular economy represents a new way of looking at the relationships between markets, customers and natural resources. And the lens through which it's viewed is disruptive to new business models powered by new technology breakthroughs, in particular digital.

How? Digital disrupts the way we produce and consume through innovative business models established by innovative technologies. Blended together, the circular economy, innovative new business models and digital revolution represent a huge opportunity for companies to create a competitive advantage, or as we put it, a "circular advantage."

In fact, our research indicates a \$4.5 trillion reward for performing circular economy business models by 2030. That's not just waste in the traditional sense of rubbish, but the significant underutilization of natural resources, products and assets. It's about eliminating the very concept of 'waste' and recognizing everything has a value. It's about moving from efficiency to effectiveness in the way we manage inputs and outputs. And by forging a much deeper bond with consumers. Going beyond point of sale, to create connections through product returns and customer engagement.

What about creating a \$10 billion business renting property without using any energy, metal or other resources to build a single house? Increasing a company's gross profit by 50 percent while reducing material use by 90 percent, all by recovering and remanufacturing used components?

Unlocking \$1 billion in previously wasted value by transforming material management in manufacturing? Or using a country's underutilized biomass resources to tap into an \$80 billion market for advanced chemicals and energy?

Global industry leaders as well as innovative start-ups are already beginning to reap huge rewards by tapping into these opportunities. And it's just the beginning. Waste to Wealth maps out how they're doing it and what other leaders can learn as they create their own circular advantage.

# Five circular economy business models

We hope to transform the circular economy from an abstract concept into an easy-to-understand, practical and applicable business model for you. But at a practical level, making the shift is not that easy. Most companies are simply not built to automatically capitalize on the opportunities the circular economy offers. Their strategies, structures, operations and supply chains are deeply rooted in the linear approach to growth—it's in their DNA.

Companies seeking the circular advantage will be required to develop new business models that are free of the constraints of linear zero-sum thinking. In the book, we describe the five main circular business models that Accenture has identified in its analysis of more than 120 companies that are generating resource productivity improvements in innovative ways.<sup>1</sup>

These models' abilities to help companies enhance differentiation, reduce cost to serve and own, generate new revenue and reduce risk—as well as their impact on the rules of resource supply and demand—are the core contributions of this book.

## 1. Circular Supply-Chain

When a company needs resources that are scarce or environmentally destructive, it can either pay more or find alternative resources. The Circular Supply-Chain introduces fully renewable, recyclable or biodegradable materials that can be used in consecutive lifecycles to reduce costs and increase predictability and control. One example: CRAiLAR Technologies Inc., a company that produces renewable biomass resources using flax and hemp to create fibers as good as cotton without the environmental impact.<sup>2</sup>

## 2. Recovery & Recycling

The Recovery & Recycling model creates production and consumption systems in which everything that used to be considered waste is revived for other uses. Companies either recover end-of-life products to recapture and reuse valuable material, energy and components or they reclaim waste and by-products from a production process. Like Procter & Gamble Company (P&G)—the company operates 45 facilities on a zero waste basis.<sup>3</sup>

## 3. Product Life-Extension

Consumers discard products they no longer value—because the products are broken, out of fashion or no longer needed. But many of these products still hold considerable value, and the Product Life-Extension model seeks to recapture it. By maintaining and improving products through repairs, upgrades, remanufacturing or remarketing, companies can keep them economically useful for as long as possible.

This means shifting from merely selling things to actively keeping them alive and relevant. It also means moving customers from transactions to relationships, tailoring upgrades and alterations to specific needs. Through its refurbishment business, Dell Inc. Computers takes back old equipment and resells units when possible.<sup>4</sup>

## 4. Sharing Platform

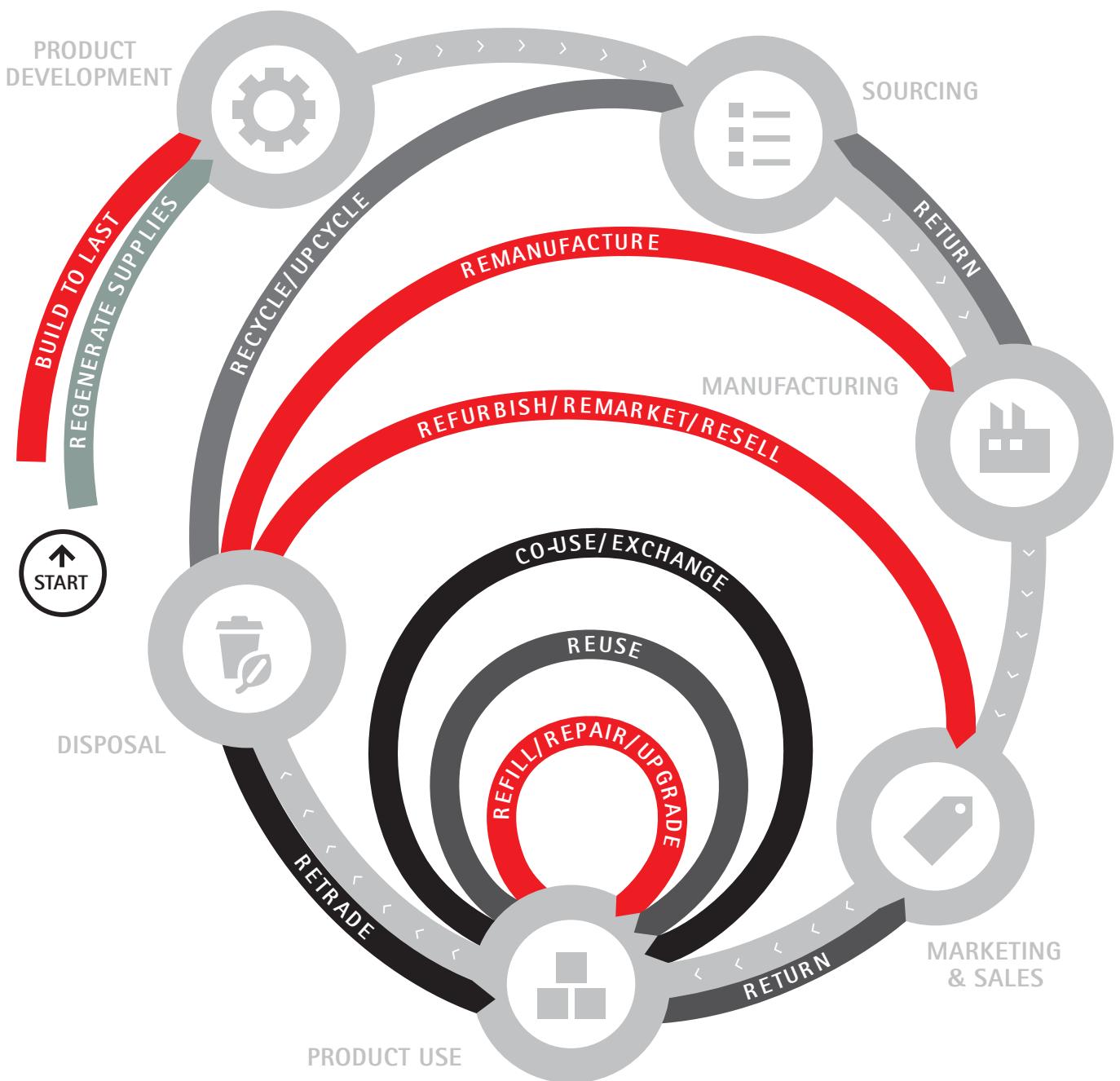
In developed economies, up to 80 percent of the things stored in a typical home are used only once a month.<sup>5</sup> The Sharing Platform model—increasingly assisted by new forms of digital technology—forges new relationships and business opportunities for consumers, companies and micro-entrepreneurs, who rent, share, swap or lend their idle goods. Fewer resources go into making products that are infrequently used, and consumers have a new way to both make and save money. Examples include Uber Inc., Airbnb Inc. and Lyft Inc. among a growing field.

## 5. Product as a Service

What if manufacturers and retailers bore the "total cost of ownership?" Many would immediately adjust their focus to longevity, reliability and reusability. When consumers lease or pay for products by use through the Product as a Service model, the business model fundamentally shifts—in a good way. Performance trumps volume, durability tops disposability, and companies have an opportunity to build new relationships with consumers. Koninklijke Philips NV is using "lighting as a service" to charge by output instead of unit sales.<sup>6</sup>

Adoption of these five circular business models has grown substantially in the past decade, even if we are still at the foothills of the coming changes. Initially, circular business model innovation was driven by start-ups. Now, large multinationals are making serious moves as well—as illustrated by a joint Accenture and United Nations Global Compact study, which found one-third of global CEOs actively seeking to employ circular economy models.<sup>7</sup>

Figure 1: The five circular business models



#### BUSINESS MODELS

-  CIRCULAR SUPPLY-CHAIN
-  RECOVERY & RECYCLING
-  PRODUCT LIFE-EXTENSION
-  SHARING PLATFORM
-  PRODUCT AS A SERVICE

#### CURRENT VALUE CHAIN

-  PATH
- >>>>> DIRECTION

# Ten disruptive technologies

New business models offer companies powerful options for embracing the circular economy. But it would not be possible to scale many of these business models without the support of 10 innovative technologies. Digital innovations in social, mobile, analytics, cloud and machine to machine communication (M2M) are especially effective in connecting physical and digital channels, and in connecting customers more broadly and deeply than ever before.

## 1. Mobile

Mobile technology spurs adoption of circular business models by enabling universal and low-cost access to data and applications. As consumption behaviour goes mobile and online, it reduces the need for physical resources ranging from paper and entertainment to stores.

## 2. Machine-to-Machine (M2M) Communication

Machines capable of communicating with one another are not new. M2M technology has long been used in factory control systems and vehicle telematics. But we're about to reach a critical mass for mainstream M2M use as wireless network coverage expands worldwide.

## 3. Cloud Computing

Dematerialization—the process of replacing something physical with a digital alternative—has placed entire industries on the endangered species list (think travel agents, music stores and newspapers). Cloud computing is key to dematerialization, along with mobile and social technologies.

## 4. Social

While social media started as a way for people to find and connect with friends and family, it has evolved into so much more. Social technology is foundational to sharing. It reduces the cost of setting up sharing platforms as it allows businesses to tap into existing networks such as Facebook®. It makes it cheaper and quicker for companies to receive consumer feedback to help improve offerings.<sup>8</sup>

## 5. Big Data Analytics

In the circular economy, many companies will generate their revenues from product use instead of sales, and growth will rely on how good they are at understanding and catering to product use behaviour. This means companies need to monitor and analyse data in entirely new ways. Complex analytics is especially important for the Circular Supply-Chain, Sharing Platform and Product as a Service business models.

## 6. Modular Design Technology

Modular design technology is not only revolutionizing how products function but also the length and nature of customers' relationships with those products. When a modularly designed product breaks, only the defective part is replaced or repaired, keeping the product relevant to its users longer and extending its overall product lifecycle.

## 7. Advanced Recycling Technology

While recycling is not at all new, it has benefited from a great deal of innovation and some significant, rapid returns on circular economy investments. Because of the advances in recycling, and its increased efficiency, more and more companies are turning to the circular economy as a source of growth.

## 8. Life and Material Sciences Technology

Life and material sciences play a key role in driving input substitution at a large scale. Ongoing innovation in this field will lead to new circular material input options. It will also bring on new ways to alter outputs so they can be used as inputs.

## 9. Trace and Return Systems

Trace and return systems support circular business models by making it more cost-effective to collect used products to service, repair, recover, reuse, refurbish or recycle them—for example, through efficient and effective material sorting machines.

## 10. 3D Printing

Arguably one of the most-hyped technologies of the past few years, 3D printing is steadily evolving to become a major player in the manufacturing world. It has also become one of the major drivers of circular business models. It facilitates repairing by making it possible to directly print suitable parts with the exact geometry. It also creates opportunities for circular inputs, inputs that are biodegradable or infinitely recyclable.

# Driving the circular advantage

The book explores what's helping to drive success in the circular economy and explores how winning companies:

- Carefully choose the business model that is right for their business, recognizing there is no one "right" answer for all companies to succeed in the circular economy. In implementing new circular business models, they make sure to identify and capitalize on external enablers and business ecosystems.
- Secure access to key facilitating technologies to support and scale new business models and use those technologies to effectively manage resources within markets, confirm waste is eliminated and monetized, serve customers and drive business and product development over time.
- Develop capabilities that effectively deploy and operate circular business principles. We describe five distinct capability shifts that help companies to create a circular flow from product design to production, retail, product use, take-back and profitable regeneration and reuse.

# Getting started

While the case for change is clear and there is considerable urgency to start making the move to circular business models, many companies still wrestle with how to get started.

They're stuck in "pilot paralysis," trying to understand what's scalable and what's not. For those organizations, we offer a simple framework that can help them assess this challenge. We present a set of strategic options executives at any organization, regardless of industry, can use to begin a move towards the circular economy. And argue that ultimate success hinges on five important initial actions:

1. Identifying and concentrating on the actual opportunity (as opposed to the noise).
2. Rethinking how value is created and delivered to customers.
3. Putting in place a focused set of new capabilities (and not trying to implement the 'perfect' circular setup, at least not initially).
4. Investing in technology to make value chains circular.
5. Timing the balance between capturing near-term, low-hanging fruit and engendering long-term, large-scale change.

# Moving to take, make, take, make, take, make

Transforming towards a circular economy means a shift from the old school approach of "take, make, waste" to "take, make, take, make, take, make." The transition may take time and effort. That's why a proactive strategy for how and when to make the move is critical.

To perform a circular advantage, the first step is to clearly understand the motives for abandoning the current linear model and the benefits that circular business models offer—including the technologies and capabilities that are critical to success.

For companies wanting to future-proof their growth agenda, the circular economy and circular advantage are the places to look. And there's never been a better time to start.



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## About Accenture

Accenture is a global management consulting, technology services and outsourcing company, with more than 336,000 people serving clients in more than 120 countries. Combining unparalleled experience, comprehensive capabilities across all industries and business functions, and extensive research on the world's most successful companies, Accenture collaborates with clients to help them become high-performance businesses and governments. The company generated net revenues of US\$30.0 billion for the fiscal year ended Aug. 31, 2014. Its home page is [www.accenture.com](http://www.accenture.com).

## About Accenture Strategy

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