

Foreword by PAUL POLMAN, CEO, Unilever

**From  
Linear to  
Circular**

**The  
FUTURE of  
PACKAGING**

**Tom Szaky**

and 15 Industry Leaders in Innovation and Sustainability

## Reflections on *The Future of Packaging*

“Plastics came of age in the 1950s, changing manufacturing forever. By telling the story that leads us to today’s linear packaging model, I illustrate that designing into the circular systems that came before it can be a short journey back.”

—**Attila Turos, Former Lead, Future of Production Initiative, World Economic Forum**

“In *The Future of Packaging*, we talk about the modern problem of waste, how packaging fits into that, and how we can design out of it. It is important to explain the forces that catalyzed the first formal recycling programs in the United States, defining the need to scale up on today’s systems.”

—**Christine “Christie” Todd Whitman, President, The Whitman Strategy Group; Former Governor of New Jersey; Former Administrator, Environmental Protection Agency**

“Moving away from the linear take-make-waste model is an ethical imperative. In my chapter I talk about the fragmented global recycling system and how investing in it presents opportunity for innovation, jobs creation, education, and, above all, prosperity.”

—**Jean-Marc Boursier, Group Senior Executive Vice President and Chief Financial Officer, Finance and Recycling & Recovery (Northern Europe), SUEZ**

“Whether you are a packaging manufacturer, small business, local government, or consumer, this book will transform the issues we’ve avoided into ones we are motivated to tackle head-on. My chapter calls for a paradigm shift in producer responsibility, placing waste and materials management in the hands of the producer as an asset, not a burden.”

—**Scott Cassel, Founder and CEO, Product Stewardship Institute**

“Almost everything is technically recyclable, so why do we have so much waste? Improving our recycling system will help us turn more waste into worth. When we view recycling in terms of supply and demand, it is much easier to see where system advancements are needed. We hope *The Future of Packaging* brings this to life and shows how all of us can do our part to keep our environment and oceans free from litter.”

—**Stephen Sikra, Associate Director, Corporate R&D, Procter & Gamble**

“Nearly every packaging ‘innovation’ that has made products lighter, less expensive, and more convenient can’t be recycled through public programs...and is thrown away after one use. In this book we deep-dive into the lightweighting trend and ways to maximize value for packages through design.”

—**Chris Daly, Vice President, Environmental Sustainability, Europe and Sub-Saharan Africa, PepsiCo**

“Packaging can be an important ally to help prevent waste, even for high-end products that often use excessive or nonrecyclable materials. My chapter has tips to help designers create premium yet sustainable packages—along with examples of brands that got it ‘just right.’”

—**Lisa McTigue Pierce, Executive Editor, *Packaging Digest***

“Packaging design isn’t just about the package but the processes associated with manufacturing, transporting, and distributing it. In this book I bring the often-unseen pre-consumer waste stream to light.”

—**Tony Dunnage, Group Director, Manufacturing Sustainability, Unilever**

“*The Future of Packaging: From Linear to Circular* is today’s handbook for designing out of a world that feeds people a skewed version of what they need to be prosperous and brands a narrow view of what they can do to be profitable...Consumers care about where their products come from and what happens after they are done with them. Brands and designers need to pay attention.”

—**KoAnn Vikoren Skrzyniarz, Founder and CEO, Sustainable Life Media, producers of Sustainable Brands**

“Consumers reward brands that make the responsible choice the easy one...Brands must today ask themselves, ‘How do we enable responsible consumption?’ *The Future of Packaging* is a resource for companies doing this heavy lifting.”

—**Virginie Helias, Vice President, Global Sustainability, Procter & Gamble**

“Leading the change you wish to see in your company can be challenging. *The Future of Packaging* contains practical models and powerful examples to champion sustainable programs. In my chapter I take you through how we stewarded circular initiatives at Procter & Gamble and my insights for applying these at a company of any size.”

—**Lisa Jennings, Vice President, Global Hair Acceleration, Procter & Gamble**

# The Future of Packaging

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# The Future of Packaging

*From Linear to Circular*



**Tom Szaky**

and 15 Industry  
Leaders in Innovation  
and Sustainability



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# The Future of Packaging

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**Berrett-Koehler Publishers, Inc.**

1333 Broadway, Suite 1000

Oakland, CA 94612-1921

Tel: (510) 817-2277, Fax: (510) 817-2278

[www.bkconnection.com](http://www.bkconnection.com)

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Distributed to the U.S. trade and internationally by Penguin Random House Publisher Services.

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First Edition

Paperback print edition ISBN 978-1-5230-9550-6

PDF e-book ISBN 978-1-5230-9551-3

IDPF e-book ISBN 978-1-5230-9552-0

Digital audio ISBN 978-1-5230-9554-4

2018-1

Cover design by Dan Tesser, Studio Carnelian. Interior design and composition by Gary Palmatier, Ideas to Images. Elizabeth von Radics, copyeditor; Mike Mollett, proofreader; Paula Durbin-Westby, indexer.

*In memory of  
Martin Stein and Robin Tator*



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# Foreword

Paul Polman

CEO, Unilever

IT IS AN UNCOMFORTABLE TRUTH THAT MUCH OF BUSINESS growth has been founded on unsustainable models of production and consumption. About 60 percent of the world's resources are already degraded or used unsustainably, and the earth has passed only minimal acceptance levels for the critical life-support systems vital for human survival, including biodiversity, fresh water, and land use.<sup>1</sup> We have a rising middle class, a world population projected to reach 9 billion by 2050,<sup>2</sup> and a planet approaching the limit of its ability to provide.

A continuation of business as usual would mean not just a slight additional strain but an inevitable crisis. The Ellen MacArthur Foundation found that 95 percent of the value of plastic packaging on the market is lost after its first use. That is equivalent to \$80 billion to \$120 billion of lost profit.<sup>3</sup> If we don't change, we will experience a status quo economy of decline—and worse.

At Unilever we understand that we are doing business in an age of mounting environmental, political, and social problems tied to the current one-way models, and we recognize that things must change. That is why we created the Unilever

Sustainable Living Plan: to decouple growth from environmental impact with a total-value-chain approach to growing business. Six years in, we are 80 percent on track for more than 50 targets, including greening our energy use toward carbon positivity by 2030 and making all of our packaging either fully compostable or recyclable by 2025.

We continue to examine business models in a new light, designing plans and products for increased sustainability and a lower carbon footprint. Just last year we piloted a new technology to recycle *sachets*—those small, single-use, plastic pouch-like items used to package household goods, personal care items, and food products that are largely unrecyclable and end up littered, landfilled, and heavily polluting. Now sachets can be turned into plastic pellets that can be used in the manufacture of new packaging and channeled back into the supply chain.

A complete overhaul of the way we produce and consume is needed, and making resource-recovery technologies and regenerative production systems an open source for the broader industry is key to wider systems change. The journey out of the current one-way, make-use-dispose *linear economy* that views products and packaging as disposable after one use will not be an easy one. We need to work up to and into a *circular economy*—the make-use-recycle-remanufacture concept wherein all materials are kept at high utility and “waste” outputs are useful inputs in the production process.

The changes needed to achieve this ideal require authentic commitments from a variety of stakeholders and, more than

that, boldness. Players in all facets of consumer goods production and consumption need to collaborate to reexamine what we create—and take responsibility for it. We need more than one innovation, and we need ones that will stick, which makes the publication of this book so timely.

*The Future of Packaging: From Linear to Circular* is a crash course on designing for the circular economy. The book is steered by Tom Szaky, waste pioneer, eco-capitalist, and founder and CEO of TerraCycle, and each chapter is co-authored by an expert in their field. From the distinct perspectives of government leaders, consumer packaged goods companies, waste management firms, and more, the book explores current issues of production and consumption, practical steps for improving packaging and reducing waste today, and big ideas and concepts we can carry forward tomorrow.

Designed to help everyone, from a small entrepreneurial start-up to a large established consumer products company, move toward a circular economy, the book can be used as a source of knowledge and inspiration. The message from our innovators is not to scale back but to innovate upward to nurture an optimistic vision of a future of abundance and prosperity, with less waste.

Look outside your own silo for new ideas and cast a net as far and wide as possible to get new direction from innovators, designers, entrepreneurs, and scientists around the world. Better solutions are possible only if all the players do their part. This book is for *you*—the future leaders—to engage and inspire you to learn from the best.



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# From Linear to Circular

Tom Szaky

Founder and CEO, TerraCycle

**B**Y NOW THE OFT-CITED PROJECTION THAT WE WILL SEE more plastics by weight than fish in the ocean by 2050<sup>1</sup> has long spread from its origins at the World Economic Forum in early 2017 to headlines in mainstream news outlets. The public now knows that plastic pollution isn't just the stray piece of litter on the hiking trail or the rogue water bottle on the beach: it's a global crisis, unsightly and largely unseen, and one that affects us all.

Plastic pollution is no longer an issue out of sight and out of mind. News outlets recently reported that 94 percent of tap water samples collected in the United States tested positive for *microplastic*<sup>2</sup>—those tiny, often microscopic particles that form when plastics break down into smaller particle sizes in the environment. Plastic waste contaminates both our water and our food,<sup>3</sup> leeching chemicals and heavy metals in our water sources and the ground where we grow our crops and, in the end, bioaccumulating in our bodies through the food we

eat and the water we drink. The Centers for Disease Control and Prevention recently reported that cancer rates in men and women are projected to increase by 24 percent and 21 percent, respectively,<sup>4</sup> between 2010 and 2020, ironically all while our cost of living has increased at unprecedented rates.

The more we look, the more we find. Just last year an uninhabited island in the South Pacific, so remote that the nearest human settlement is a small island 200 kilometers away, was recorded to be covered by more than 35 million pieces of plastic. Chunks of plastic discovered on the ice and floating in the oceans of the Arctic had initially prompted fear in researchers about the far reach of this man-made waste. Then it was discovered that the levels of plastic pollution in Antarctica—the very end of the earth—were five times worse than predicted. **SEE I.1**

What is just now surfacing as a revelation to consumers has been long known to manufacturers, retailers, and governments—and confirmed and obscured by the plastics industry for much longer: plastics are nearly indestructible, far from “disposable,” and highly polluting.<sup>5</sup>

## **The Current State of Affairs**

Only 35 percent of the 240 million metric tons of waste generated in the United States per year gets recycled.<sup>6</sup> Nearly half a century has passed since the launch of the first universal recycling symbol, and recent estimates say that 91 percent of plastic is not recycled.<sup>7</sup> Plastics production is outpacing waste management, let alone recycling, and a significant portion of



**I.1** Plastic pollution is now recorded as having reached the most remote and pristine places on earth.

the problem comes down to our addiction to single-use packaging and disposable products.

To effectively meet this challenge, we need to understand its origins and why our world is addicted to disposability. And there is room for hope: the idea of waste is modern—roughly 70 years old. It was only in the 1950s that complex materials became commercialized on a mass scale, replacing age-old reusable models like “the milkman” and cobbling one’s shoes. They did so because single-use, “disposable” products and packages make life more convenient and affordable, increasing access to goods for all strata of society. As a result, humanity makes and purchases 70 times more stuff today than we did in the 1950s, stuff that is typically made from materials that nature lacks the capacity to absorb.