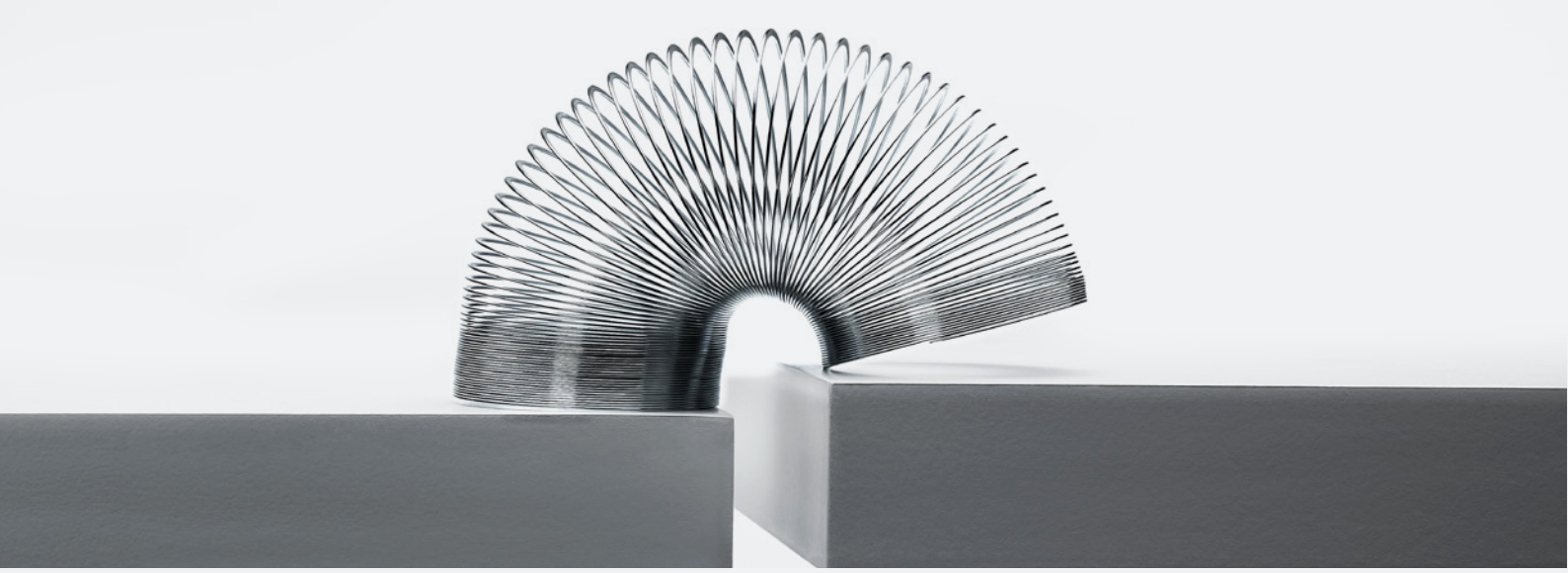
THE CIRCULAR ADVANTAGE

Moving from insight to action

Preview to The Circular Advantage Handbook

Five years ago, with Waste to Wealth, Accenture established that a $4.5 trillion[1] global opportunity is on the table for organizations that incorporate five new circular business models and enabling technologies into their business construct. Since then, having analyzed more than 1,500 circular case studies, and having collaborated extensively with our clients and partners to deliver leading circular economy strategies around the globe, we've learned a lot.

We are pleased to share with you some of our findings, which will be developed further into a "how to" handbook, to be published in 2019. The handbook will support leaders with tangible circular strategies and actionable insights on how to scale the circular economy within their organization and drive competitive advantage through their value chain.



While organizations and governments the world over make significant advances in their sustainability journeys, recent reports clearly indicate we are still woefully behind on the Sustainable Development Goals (SDGs) and climate related targets. As natural resources become increasingly scarce, misused, and highly regulated, the risks of value erosion for businesses, and the consequences on our environment and our societies, multiply exponentially. If we want to avoid the grave outcomes of the linear trajectory - there is no longer a choice but to pave a new way forward. Moving to a circular economy has the potential to not only deliver the disruptive change and impact we need to secure a sustainable future, but also opens the door for businesses to new markets, products and services – a clear path to innovation and growth.

Now we must ask ourselves - how are we doing, and how do we get there?

1. **Progress has been made, but it is not enough –** Organizations globally have proven there is a business case for circularity through the adoption of circular business models and Fourth Industrial Revolution (4IR) technologies, but efforts generally focus on quick wins, small-scale initiatives, or programs which can be "retrofitted" into business-as-usual. Competitive advantage is about fundamentally reengineering the business – more must be done to reach this value potential.

2. **Bolder disruptions are required –** Siloed business models and technologies will only go so far. True impact and scale will be delivered when business models and 4IR technologies are applied in a blended manner to enable organizations to pivot wisely, capturing new growth opportunities while strengthening the core business.

3. **Holistic maturity is essential to transform the value chain –** In their circular journeys, organizations tend to address circularity first within their internal functions, like operations, as here most control is possible. The maturity journey then focuses outward to transform product and service portfolios, which is challenging, as market dynamics and customer relationships add another layer of complexity. When an organization's own value chain is transitioning successfully, leading circular companies then tend to work on fostering the enabling environment necessary for broader ecosystem development. Within this journey to maturity, the "how to" is multifaceted - identifying and implementing the right mix of high value initiatives which weave together various functions of the organization, and players within and beyond the value chain is key.

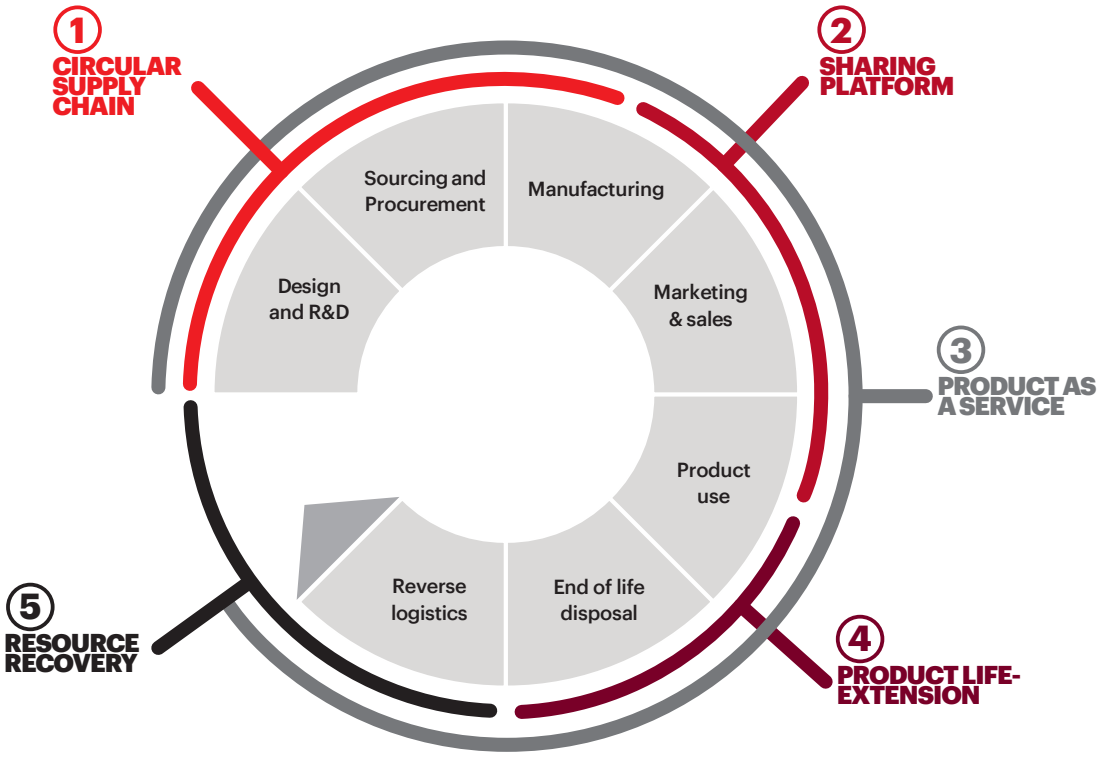
4. **A value-driven, circular future is possible –** If the arc of the curve is right, the synergies of the circular economy movement and the Fourth Industrial Revolution (4IR) will not only enable companies to leapfrog competitors in this volatile economy, but also create an economic system that puts people and nature first.

WHERE ARE WE NOW?

Redefining business-as-usual

Over the past five years, we have seen the circular economy rapidly evolve from a fringe sustainability trend, being tested at small scale by forward-thinking organizations, to a significant movement being adopted far and wide across the global business and public-sector landscape — not only as a means to drive environmental "good" but also as a way to deliver business value. Moreover, as revealed in a recent Accenture Strategy study,[2] shifting consumer preferences are evolving the value levers further, with nearly two-thirds of consumers globally preferring to buy goods and services from companies that are purpose driven.

Circular business models are the foundation



1) *Circular Supply Chain* *Use of circular materials, either renewable, bio-based, or highly-recyclable to replace virgin inputs.* **2) *Sharing Platform*** *Increase utilization rates of products through collaborative models for usage, access, or ownership.* **3) *Product as a Service*** *Offer of product use with retention of the product ownership by the producer to increase resource productivity.* **4) *Product Life-Extension*** *Prolongation of the lifecycle through repair, reprocessing, upgrading and resale.* **5) *Resource Recovery*** *Recovery of usable resources or energy from waste or by-products.*

In our analysis of ~1500 circular economy case studies from **The Circulars**,[2] and through our various circular strategy engagements with dozens of clients and partners across the globe, we found that all the five business models we defined in *Waste to Wealth* support the circular transition, but adoption and success across the models to-date is varied due to a range of complexities and barriers that need to be overcome.

The Circulars is a 5-year circular economy award program, run by the World Economic Forum and the Forum of Young Global Leaders in collaboration with Accenture Strategy. The awards offers recognition to individuals and organizations across the globe that are making notable contributions to the circular economy.

Typically, we see most organizations make an inward to outward transition – dealing first with operational inefficiencies that have a clear business case. It's no surprise then that **Resource Recovery** is the most adopted business model – it's an extension of more traditional waste recovery and recycling and is supported by a well-established waste management industry. However, more needs to be done to tackle wasted resources — global recycling rates remain low, with limited consumer engagement, complex policies, and further investment in infrastructure inhibiting high-quality end-of-life solutions.

The **Circular Supply Chain** consists of two distinct models, renewables and circular materials. Renewables have proliferated due to the lowering cost and growing efficiency of renewable energy technology. Adoption of circular material solutions are slower as they are not always cost effective and can be difficult to implement, relying on the incorporation of new designs and processes, among other factors. However, material innovation is beginning to scale as R&D investment is unlocked, and as a result, technology advances more rapidly.

Moving to consumer-facing models is where things typically start to get more complex. Organizations must not only re-consider how they manage customer relationships, but in many cases, they must also fundamentally shift how they conduct business. **Product Life Extension** uptake has been moderate – these models require intensive attention to designing for longevity, as well as new infrastructure and take-back solutions to enable repair and upgrade more widely.

Sharing Platforms and Product as a Service models require the greatest disruptions, so unsurprisingly have seen the least uptake. A **Sharing Platform** model works best with high-value, low-use, functional products. Dominance to date in the mobility and hospitality sectors has addressed wasted capacity, although the environmental externalities are often difficult to calculate. There is a promising opportunity, however, for sharing platforms in the B2B space and in emerging economies. The **Product as a Service** model requires a fundamental transformation of business models built on exchange of goods for money as opposed to provision of goods for utility. To-date, this has been a key barrier. The shifts needed to overcome this include sharp customer centricity for targeted value delivery, incentivizing repair and reuse, and a revised lens for accounting and finance of service-driven business models.

Technology as the key enabler

Key to successful implementation of the circular business models is the use of the right disruptive 4IR technologies, which span the **digital**, **physical**, and **biological** realms.

DIGITAL

Technologies based on computer sciences, electronics and communication, which make use of increasing information intensity and connectedness of physical resources

Artificial Intelligence		Internet of Things
Machine Learning	Cloud/ edge	M2M comm.
Machine Vision	Big Data Analytics	Mobile Devices
Blockchain	Digital Anchors	Digital Twin

PHYSICAL

Technologies based on basic property of materials, energy, forces of nature and their interaction

3D Printing	Robotics	Energy Storage
Energy Harvesting	Nano-technology	Spectroscopy
Physical Markers	AR/VR	Carbon Capture & Storage
	Material Science	

BIOLOGICAL

Technologies based on biology, aspects including but not limited to biological systems, living organisms, or derivatives thereof, to make products and processes for specific use

Bio-energy	Bio-based Materials	Genetic Engineering
DNA Marking	Cellular & Tissue Engineering	Hydroponics & Aeroponics

Of the 27 4IR technologies we identified,[4] organizations have adopted digital technologies more widely compared to physical and biological technologies. Substantial investment, ease of implementation, and wide-ranging accessibility are a few reasons why digital tech adoption is pervasive.

While the growth in physical and biological technologies is steady – physical technologies are still limited by the sizeable capital intensity requirements, and biological technologies by the considerable R&D timeframes required to bring a solution to scale.

THE 4IR technologies making the biggest impact within the circular economy today [5]

DIGITAL

INTERNET OF THINGS
Intelligent connections between objects and devices enabling information to be shared across an environment or ecosystem

MACHINE LEARNING
A set of technologies, such as machine learning and machine visioning, that enables machines to simulate human intelligence, and learn continuously, to perform complex functions

PHYSICAL

ROBOTICS
Machines that are programed to carry out a complex series of actions - suitable for repetitive and rule-based processes and tasks

ENERGY HARVESTING
Using specialized materials or equipment to capture, store, and supply energy that would otherwise be lost as heat, light, sound, vibration or movement

BIOLOGICAL

BIO-BASED MATERIALS
Biological materials with organic properties that make them compostable and/or recyclable, that are used to substitute synthetic, scarce, or harmful materials

BIO-ENERGY
Renewable energy derived from natural and organic matter, such as plants, waste and fuels

Targeting competitiveness

We have seen the most competitive organizations, who have adopted circular business models and 4IR technologies successfully, were able to achieve growth and profitability while driving sustainability, and in most cases *because* of it. That is, not only could growth, profitability, and sustainability be attained simultaneously; the three outcomes have, in fact, been highly correlated.

However, these leaders are not the majority. While many organizations have been taking the right first steps by addressing systemic linear issues, efforts have largely focused on tackling the end problem and targeting "quick wins" rather than addressing the root cause. For example, the plastics pollution challenge is that of source, supply, and leakage – it cannot be solely addressed through end-of-life collection, where much current focus lies. The same can be said about energy management — although efficiency is the key driver, demand, supply, and conservation efforts must be considered holistically to obtain transformational results.

WHERE TO NEXT?

Pivot wisely for scale

For organizations to scale circular strategies as a competitive asset, they must deploy a combination of new business models and technologies to systemically reduce value erosion across the value chain and open the door to new opportunities for growth.

Unlocking the true power of business models and technologies

Although the use of a single business model is effective and provides proof of value, the most scalable results appeared when business models are used in combination to unleash powerful synergies. Several multinational organizations — Dell, Nike, Royal DSM, Schneider Electric and others — have used different combinations of circular business models in ways that have simultaneously improved their resource efficiency, reduced costs, enhanced their customer value proposition, and driven growth through new revenue streams backed by brand reputations.

Thus, the goal for executives is not only to identify the right business models to implement, but also to figure out the different combinations that will deliver the greatest return on investment. IKEA, for example, is transforming its value chain with a cradle-to-cradle mindset. At the start of the value chain, the company is increasing recycled and circular material usage in their products.[6] Towards the far-end of the value chain, IKEA is promoting resource recovery [7] and product life extension [8] through product takeback programs.

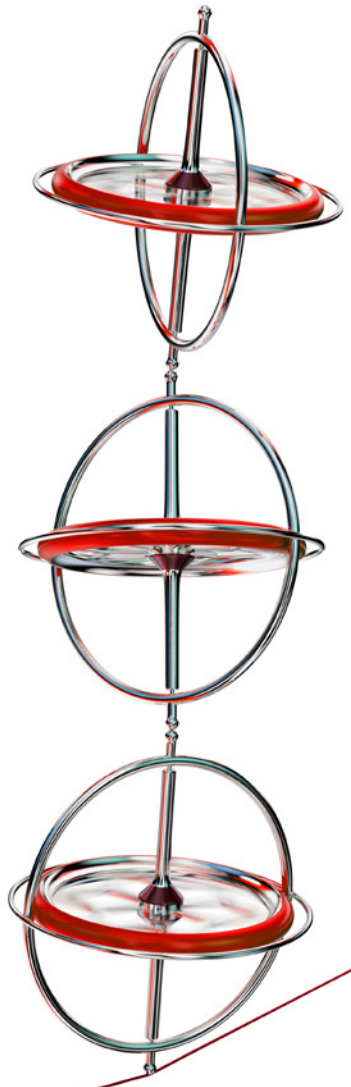
Additionally, several global organizations are already securing competitive advantage and achieving circularity through use of 4IR technologies at scale. However, certain circular challenges push organizations into totally new territory, and call for unique, out-of-the-box solutions. This is where the power of blended technologies becomes evident. Apple is using a combination of physical and digital technologies to recover valuable materials from end-of-life iPhones. Daisy, a line of robots, powered by machine learning and big data analytics, can disassemble up to 9 different types of iPhone devices at a speed of 200 iPhone devices per hour. For every 100,000 iPhone devices, Daisy has the potential to recover 710 kilograms of copper, 7.5 kilograms of silver, 11 kilograms of rare earth elements, 93 kilograms of tungsten, along with other high-value materials.[9]

The wise pivot

Achieving growth and profitability while implementing circular initiatives supported by technology solutions is a substantial task. This transformation has inherent risks and for a successful rotation, it needs considerate investments in the form of funds and capabilities.

We found that successful companies make a 'wise pivot' by undertaking three simultaneous actions — transforming the core business to drive up investment capacity, growing the core business to sustain fuel for investments, and scaling the new initiative to identify and fund new growth opportunities.[10]

The need to pivot wisely is not new, but the rules of play have changed. In the past, companies have endured large disruptions in the business environment, for instance, with the IT revolution, the internet, and, more recently, the rise of social media. However, the landscape in which firms operate today is much more dramatic and volatile than before. Consequently, it is increasingly important for companies to know exactly *how* to pivot to new business models and technologies when activating a circular economy.



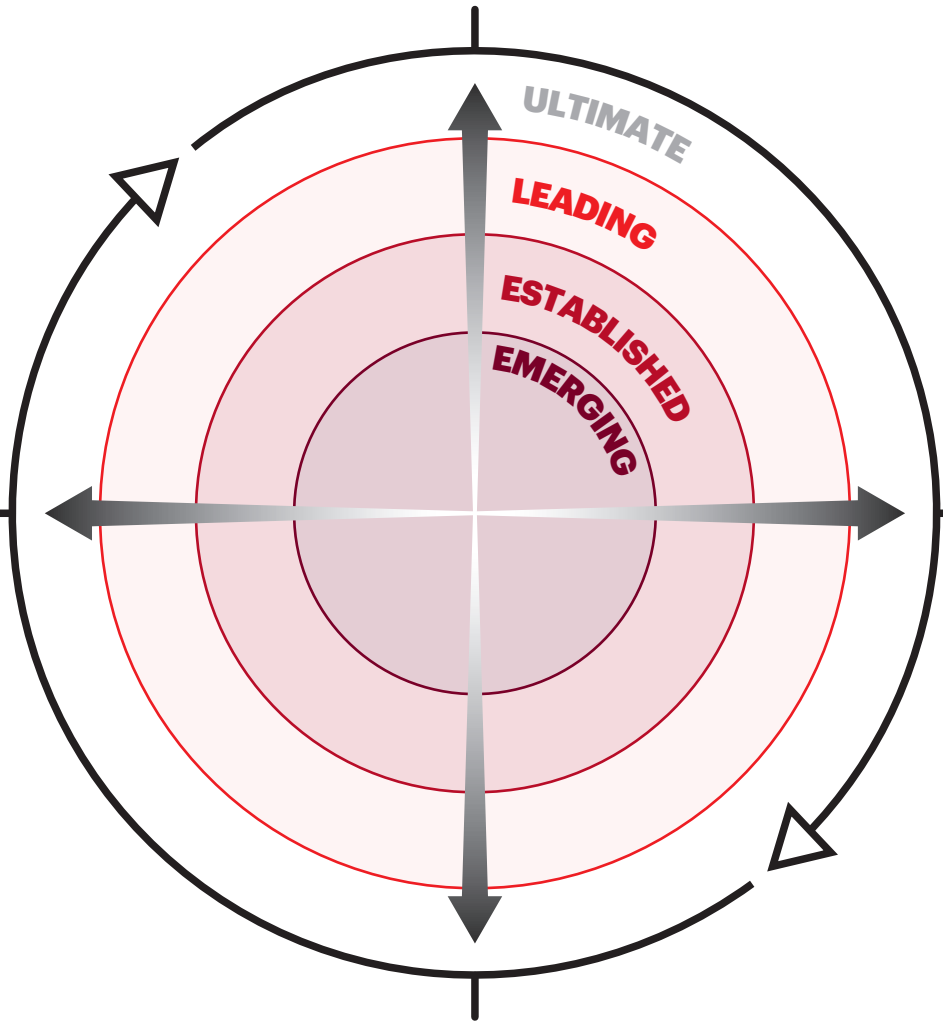
HOW DO WE GET THERE?

Maturity across the value chain

The road to maturity is long and meandering, but equally rewarding. To become a leading and competitive circular organization, companies must mature along four dimensions.

Operations

Addressing the value lost through the by-products of business processes across energy, emissions, water, and waste



External Ecosystem

Collaborating and partnering with public and private sector peers, to create an enabling environment for collective transformation

Culture, Talent & Organization

Embedding circular values into the fabric of an organization through redefined working practices, policies, and procedures

Products & Services

Re-thinking the design, lifecycle, and end-of-life stage of a product or service to optimize usage and close the loop

An organization will struggle in driving scalable value from circular strategies without maturing optimally along each of the four dimensions. Hence, executives that keep in sight all four areas, while strategically prioritizing initiatives across all dimensions, will drive exponential value from incremental investments.

Although a plethora of circularity options exist along the maturity journey, leaders need to identify and prioritize initiatives according to their organization's needs, growth appetite, place in the market, and current maturity. In general, companies initially anchoring their circular journey on **internal operations** should conduct a broad-based assessment of early-win circular solutions and then craft larger transformations on those. Global FMCG leader AB InBev has successfully made this shift, saving over $60m through energy-efficiency initiatives, in addition to resource efficiency gains from water, packaging materials, and other inputs.[11]

Organizations that are evolving further in their journey should focus on removing bottlenecks resulting from the traditional ways of doing business, and weave circular initiatives into their their **product and service portfolios,** and **organizational fabric.** Patagonia is a torchbearer in product innovation as it designs products using high-quality circular materials, which in turn enables effective repair and reuse, and efficient deconstruction towards end-of-life,[12] ultimately creating new and improved customer dynamics. Danone is tackling another important dimension of maturity and focusing on culture change - providing education and trainings within the organization and across their value chain to incorporate circular thinking and behaviors within the workforce and with business partners.[13]

Finally, organizations that are ready to look outwards should focus not only on moving beyond zero to net positivity within their value chain, but also support the maturity of the **broader ecosystem** by collaborating with external stakeholders to transform the business landscape and help evolve the rules of the game. The Platform for Accelerating the Circular Economy (PACE), a public-private collaboration platform with over 40-member organizations like Philips, Google, and UN Environment, is doing just that.[14] The regulatory regime is also a key enabler when an organization is looking to mature its ecosystem engagement. Organizations can proactively support a successful regulatory environment by working with the public sector and cross-industry peers to co-create smarter policies that will enable a systemic step change in the circular economy.

HOW VALUABLE
is a circular future?

Our most recent analysis shows that the $4.5 trillion global circular economy opportunity we identified in *Waste to Wealth*[15] is still there for the taking, but that's not all - the move towards circularity represents an unmissable opportunity for companies across a whole range of industry sectors. Accenture has analyzed the value at stake for a cross section of industries by 2030. This has revealed the true scale of the shift that is possible. Fast Moving Consumer Goods companies could realize $80 billion of additional profit through wise investments in circular packaging.[16] This would represent net improvement of 2% - 3% in average margins. The global fashion industry could unlock $150 billion of net new revenue through tackling waste and encouraging reselling of used products at scale.[17] Companies in the electronic devices sector that would increase sales of refurbished devices and reduce their material costs, could capture some of the $40 billion of value potential in that industry. These are just three of a raft of ways in which improved circularity can translate to the bottom line for those prepared to innovate and invest.

Organizations leading in the circular economy are already harvesting positive financial and environmental returns, but it is clear those willing to push the boundaries to the next circular frontier can generate significantly more value for their customers, shareholders, and stakeholders alike. Five years ago, the circular economy discussion was that of establishing a business case; today, the focus is on capturing competitive advantage. The question no longer is "Will the circular economy deliver value?" but instead, "How far can I go?" – with the right mindset, strategy and execution, the opportunities are endless.

We welcome your feedback and inputs as we continue to shape The Circular Advantage handbook - we look forward to learning and sharing with you as we collectively drive forward the circular economy movement.

AUTHORS AND CONTRIBUTORS

Peter Lacy
Senior Managing Director, Accenture Strategy

Jessica Long
Managing Director, North America Lead, Sustainability & Trust, Accenture Strategy

Wesley Spindler
Business Strategy Manager, Accenture Strategy & Circulars Program Director

CONTRIBUTORS
Lucy Harvey, Jay Thakkar, Alden Hayashi & The Circular Advantage handbook team

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ENDNOTES

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[15] Accenture Strategy analysis

[16] Accenture Strategy analysis

[17] Accenture Strategy analysis

[18] Accenture Strategy analysis