accenture

CHEMICAL (RE)ACTION

Growth opportunities in a circular economy

Contents

While sustainability has long been on the chemical industry agenda, the value paradigm is shifting fast.

In response to rising environmental concerns and regulatory change, the value of the circular economy worldwide is set to hit US$4.5 trillion by 2030.[1]

By capturing a share of this rapidly expanding market for reusable, renewable and recyclable products, chemical companies can turn these changes to their advantage and drive growth while helping to shape a greener, cleaner, more sustainable future.

The chemical industry touches us all in countless subtle and unseen ways. From life-saving healthcare devices and personal care goods to food, transport and clothing, around 100,000 chemicals are used in the world today, impacting every aspect of our daily lives.[2] They account for a global industry worth an estimated US$4.7 trillion.[3] But the industry is at a tipping point, with disruptive pressures set to drive new business models and value chains, while creating opportunities for those ready to embrace them.

Globally, resource constraints and rising concerns about sustainability are changing how consumers think about chemicals. They're calling out brands and retailers on social media and petitioning for more responsible corporate stewardship of our planet. They're also flexing their purchasing power. According to new Accenture research of 6,000 consumers in 11 countries, just over half of those surveyed said they would pay more for sustainable products, and almost three-quarters (72 percent) are more likely to buy eco-friendly products than they did five years ago.[4]

In response, downstream industries (for example, automotive, clothing, electronics, food and toys) are rethinking the design of their products, packaging and use of chemicals to embed circularity throughout the entire product lifecycle.

As they seek ways to bring more environmentally friendly products with cleaner ingredients to life, they're looking to the chemical industry for answers.

By creating greater transparency for consumers, greener innovation for manufacturers and accountability to stakeholders, chemical companies are uniquely positioned to lead the shift to the circular economy and hasten its adoption. Opportunities for growth abound, but with changing perceptions driving new buying behaviors, companies must act fast—or risk getting left behind.

One

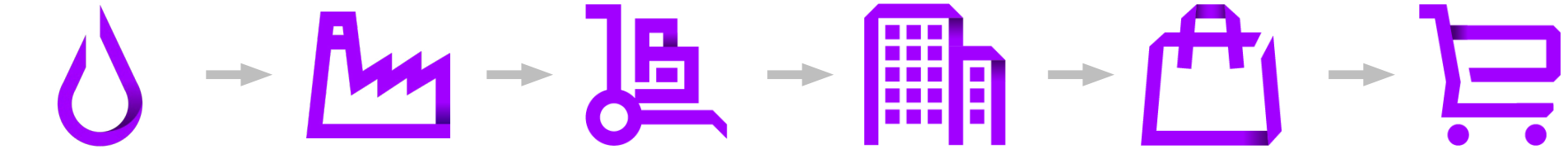
Upstream pressure, downstream disruption

From consumers to retailers to brands, and finally to chemical manufacturers, steady pressure, propelled by increasing environmental attention, is being applied to the industry.

While the chemical industry has been somewhat shielded in the past from direct consumer pressure, changing consumer preferences are making an impact—at the same time as downstream industries are facing disruption.

Figure 1

Product value chain



Source: Accenture Strategy

Across product sectors, we see this affecting typical value chains like the one illustrated in **Figure 1**.

Just as raw material inputs affect the sustainability and reuse potential of a product, the chemicals used in production affect the circularity potential of finished goods. Wood furniture, for example, often ends up in a landfill because it contains resins and lacquers that limit reuse potential.

Similarly, retailers are often stuck with packaging that can't be recycled due to laminates or coatings used to protect food and beverages. These are typical of the highly complex challenges driving demand for more innovative, readily recyclable materials and solutions. So let's start by taking a closer look at what's changing in the relationship between consumers, brands and the chemical industry.

Changing consumer preferences

According to Accenture research, consumer attitudes and buying preferences related to sustainability are shifting. These trends are seen across all downstream industries.

81%

of consumers plan to buy more eco-friendly products over the next five years.[5]

62%

want companies to take a public and passionate stance on social, cultural, environmental and political issues.[6]

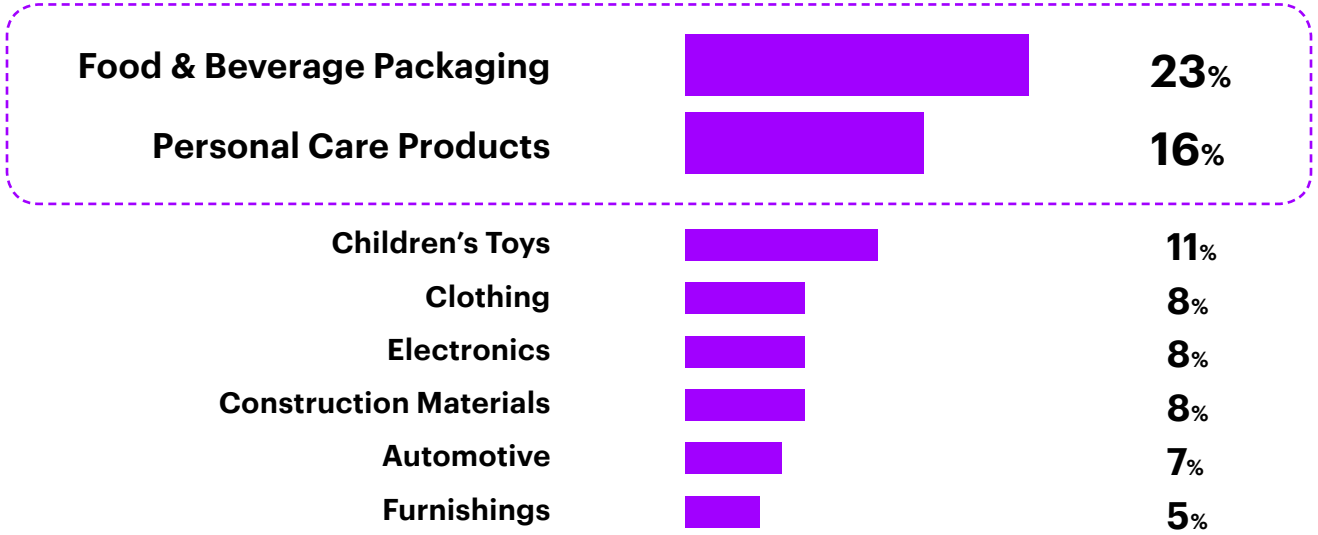
77%

perceive plastics to be the least environmentally friendly packaging material.[7]

As illustrated in **Figure 2**, consumers report that they've stopped buying one or more products due to environmental concerns, with food and beverage packaging (23 percent) and personal care products (16 percent) topping the list. With purchasing decisions at stake, brands and retailers are responding and working to address these concerns to retain brand loyalty.

Figure 2

What are consumers no longer buying?

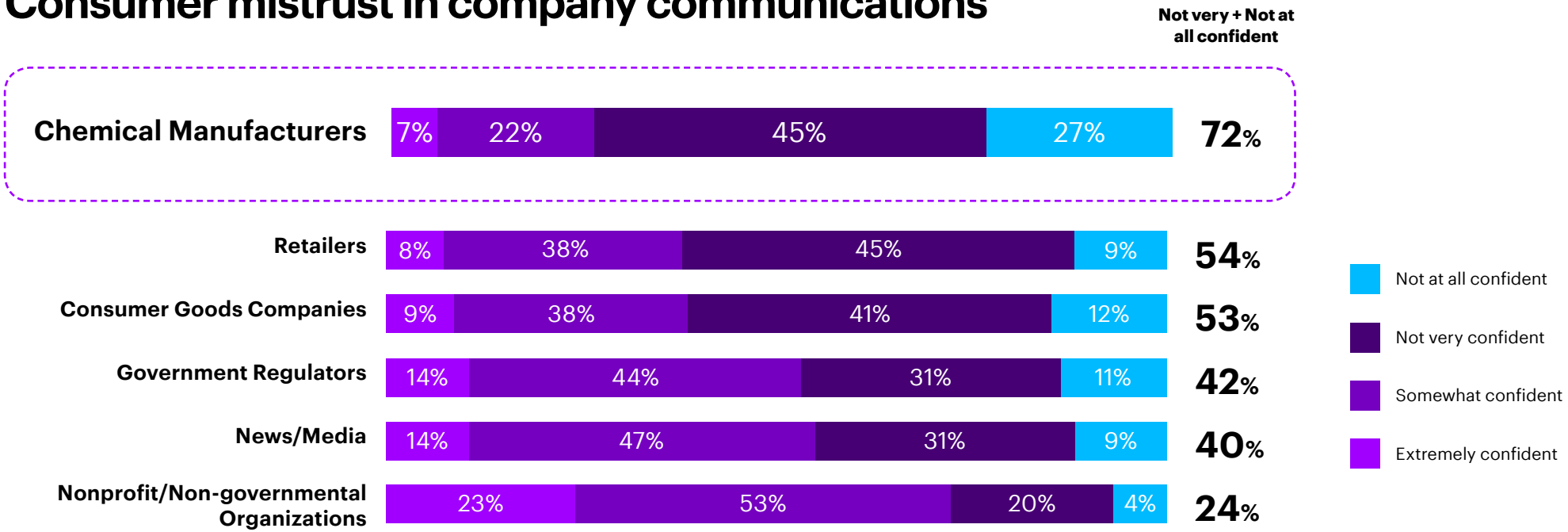


Source: Accenture Chemicals Global Consumer Sustainability Survey, 2019

Challenges with waste, carbon dioxide (CO_2) emissions and single-use plastics have emboldened consumers and advocacy groups to call for corporate action. This has come sharply into focus with the high-profile debate around plastic waste, which has catalyzed a shift in public sentiment. Although many chemical companies make significant contributions to sustainability initiatives, the industry is among the least trusted when it comes to environmental protection.

Figure 3

Consumer mistrust in company communications



Source: Accenture Chemicals Global Consumer Sustainability Survey, 2019

The research revealed that 72 percent of consumers are either "not very confident" or "not at all confident" in the information they hear from chemical manufacturers on the environmental impact of their products and/or services.[8]

As seen in **Figure 3**, this is the highest ranking of mistrust among the sectors surveyed. Additionally and more worrying, one in four consumers (26 percent) believe the chemical industry is the least concerned about its impact on the environment.[9]

Consequently, when the plastics industry is scrutinized and chemical manufacturers remind the public of the advantages and positive impacts that plastic has across multiple sectors, this lack of trust may lead consumers to put more weight on what they hear from other sources.

Hundreds of companies, for example, have signed the Ellen MacArthur Foundation's Global Commitment on the New Plastics Economy, demanding that 100 percent of plastic packaging be reusable, recyclable or compostable by 2025.[10]

What's not easily visible to consumers is that the signatories represent more than 20 percent of all plastic packaging used globally, including many of the world's leading packaged goods companies, retailers and plastic packaging producers.[11]

Commitments like these are a challenge for chemical manufacturers. Plastic production represents a significant part of their business and 40 percent of plastic is used for single-use packaging.[12] Currently, only nine percent of plastic waste is recycled globally.[13] But demand for polymers associated with single-use plastics will likely decrease as brands and retailers seek more durable alternatives that can be reused without molecular modification. In fact, global demand growth for virgin petrochemicals could drop by half in an extreme case from about four percent per year in 2019 to two percent per year in 2040.[14]

Although this presents a very real risk to the US$700 billion global plastics industry,[15] there is a growing multibillion-dollar market for recycled materials. So clearly there are compelling opportunities for those who can offer more sustainable options. In readiness for this, several chemical and plastic manufacturers are proactively addressing plastic waste, reuse and recycling through organizations like the Alliance to End Plastic Waste, a nonprofit group committed to investing in innovation and developing solutions (at scale) to mitigate the negative environmental impact of single-use plastic.[16]

Impact on the chemical industry

With consumers making their voices heard, let's think more about the implications for the chemical industry, again, using plastics as our example.

For consumers, the growing perception that single-use plastic is bad for the environment is simple to comprehend and easy to act on—buy less plastic, reuse existing plastic materials and recycle.

83%

of consumers think it's important for companies to design products that can be reused, recycled and never go to a landfill.[17]

And while quality (89 percent) and price (84 percent) remain top considerations when making purchases, we can see in **Figure 4** (page 11) that just over 50 percent of consumers would be willing to pay more for a product designed for reuse or recycling rather than to be thrown away. This trend is even more pronounced among younger consumers (40 and under) and consumers in Asia.[18]

Figure 4

Consumer willingness to pay more for sustainable products

	Full Survey	By Age		By Region		
	Average	Gen Z & Millennials (Age 18–40)	Gen X & Boomers (Age 41–70)	Asia	Europe	North America
Willing to pay a premium	54%	67%	39%	65%	49%	47%
Not willing to pay a premium...						
...but would choose such a product over others, all else being equal	28%	20%	37%	23%	31%	31%
...and this would not impact buying decision	18%	13%	24%	12%	20%	22%

Source: Accenture Chemicals Global Consumer Sustainability Survey, 2019

What's especially notable is how these results suggest a shift in the long-held notion that consumers won't pay more for sustainable products. The research seems to reveal a change in consumer preferences, offering chemical manufacturers new insights on how to capitalize on changing demand. Using these results as a jumping-off point, chemical manufacturers can start to assess where best to innovate and adopt circular economy principles. They can target areas where consumer willingness to pay more can offset incremental innovation and manufacturing costs while providing downstream solutions that benefit brands and retailers.

Retailers and brands are reacting

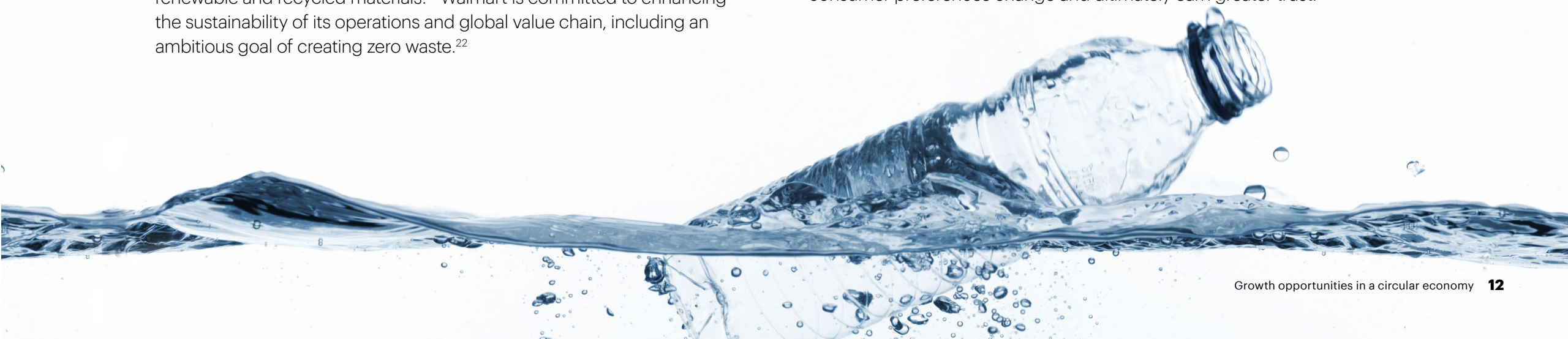
With many advocacy groups focusing on single-use products and packaging, pressure on brands and retailers is accelerating the shift to circularity. Take Greenpeace's global campaign targeting Coca-Cola's estimated 100 billion plastic bottles, coining the slogan: "*Don't let Coke choke our oceans.*"[19]

While Coca-Cola had a goal to collect and recycle the equivalent of 75 percent of the bottles or cans it sold, it increased the commitment to 100 percent by 2030 as part of its "World Without Waste" initiative launched in 2018.[20]

Retailers like IKEA and Walmart are also responding. As this trend increases, chemical manufacturers can expect a shift in demand from products that inhibit reuse toward sustainable alternatives. IKEA has a plan to become "people and planet positive" by 2030, designing all products with new circular principles that include the exclusive use of renewable and recycled materials.[21] Walmart is committed to enhancing the sustainability of its operations and global value chain, including an ambitious goal of creating zero waste.[22]

Consider too 3M, which has announced a requirement for sustainability to be built into all its products, stating that every new product must have a sustainability value commitment,[23] many of which are circular economy related. As Gayle Schueller, 3M's vice president and chief sustainability officer, said: "New types of products are needed. Stakeholder pressures aren't going away and it's smart to reinvent our portfolio. When we innovate with sustainability in mind, very often we save money and reduce waste. 3M has prevented more than 2.5M short tons of pollutants and has saved over US$2.2 billion from first year savings alone from these projects."[24]

Rather than fear the shift to a circular economy, now's the time for the chemical industry to anticipate new trends, develop clear business strategies and offer their customers innovative solutions. By helping manufacturers, suppliers and retailers embrace circularity, chemical companies can become powerful partners, helping brands respond fast as consumer preferences change and ultimately earn greater trust.



Two

A golden opportunity

Recessions aside, the global chemical industry has seen relatively steady growth for decades. But hidden pressures are mounting, and chemical manufacturers must be prepared.

The converging impact of changing consumer preferences, pending global regulations, aging infrastructure and lack of trust are putting the chemical industry at risk of significant disruption.

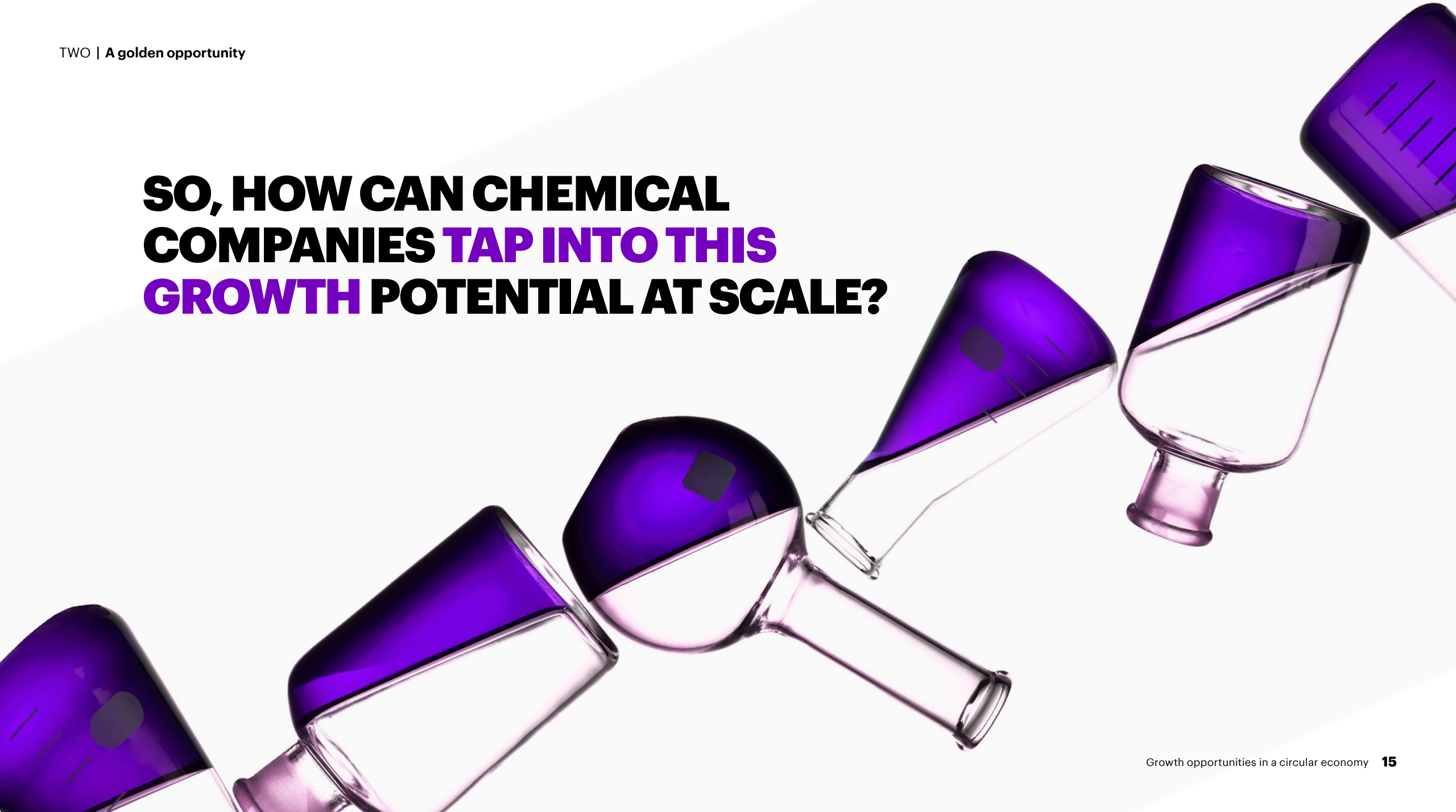
While sustainability is not a new topic for chemical companies, they have traditionally tended to view it from a health and safety risk perspective, focusing on eliminating toxicity, for example. But as consumer interests shift, brands and retailers are on a change journey to realize the value of circular operations, products and services.

And herein lies the opportunity for chemical companies to help their customers fulfill sustainability and corporate commitments—like eliminating waste and achieving carbon neutrality—to drive direct business value, enhance brand reputation and increase consumer loyalty.

And at a time when consumers are steering the environmental debate, proactively driving the circular economy can help chemical manufacturers reaffirm their environmental commitment, reset perceptions and build trust. They could thus have a bigger say in conversations about product innovation and strengthen their position in the emerging industrial landscape.

While there are obstacles, there are big rewards for those that can provide viable solutions to complex downstream sustainability challenges. Looking at just the European chemical market, Accenture research suggests that circular solutions could unlock 26 percent potential net growth through capitalization of new needs, reduced energy usage and evolving downstream demand.[25]

SO, HOW CAN CHEMICAL COMPANIES TAP INTO THIS GROWTH POTENTIAL AT SCALE?



The circular economy: a closer look

In a circular economy, today's linear "take-make-waste" model—where materials are made into products, the products used and materials then discarded—is replaced with an approach that eliminates the concept of waste and unlocks new value by continuously keeping products, components and materials at their highest utility and value.

Materials and molecules are constantly cycled back through the value chain for reuse, resulting in less energy and resource consumption, creating new opportunities to realize cost savings and reinvest for growth.

Adopting internal circularity

Chemical manufacturers can unlock trapped value through cost savings by embedding circularity within internal operations.

By capturing the value of recirculating molecules from used products at their end-of-life, they can utilize more renewable feedstock. And with feedstock accounting for approximately 60 percent of a chemical company's total costs,[26] less price-sensitive alternatives can drive cost savings and improve price stability. This also creates incentives to design products for reuse, making a positive contribution to the circular economy in both downstream and upstream applications. As a result, the use of circular inputs can help chemical companies strengthen relationships with brands and retailers, build consumer trust and offset disruptive potential.

Embracing green chemistry

By 2020, the global green chemistry market is expected to hit US$100 billion,[27] giving chemical manufacturers another way to capitalize on internal circularity. Designed to reduce development or use of hazardous substances, green chemistry principles include (but are not limited to) preventing waste, increasing energy efficiency, using renewable feedstocks, avoiding derivatives, designing safer chemicals and minimizing accident potential.[28] While adoption may require initial investment costs, these will be offset as sustainable product design increases demand. What's more, investing in green chemistry now will protect market share as new players seek to enter and disrupt the market.

Enabling circularity downstream

With the transition from conventional production to approaches where circularity becomes the norm, the product value chain will evolve into a continuous process where materials are collected and reused.

As downstream companies seek to reformulate recipes, rethink material inputs and reinforce their sustainability commitments, they'll need expert guidance. And chemical manufacturers are ideally placed to drive new growth by helping these brands and retailers develop more durable, eco-friendly products.

Leveraging the power of partnerships

Proactively partnering with brands and retailers to help them enable circularity downstream will be a key differentiator, allowing chemical manufacturers to capitalize on new trends and revenue streams. Unilever, for example, recently signed a three-year contract with Veolia to collaborate on innovative circular economy solutions for plastic packaging waste.[29] Emulating this approach, chemical companies can provide the vital consulting and technical capabilities to guide brands and retailers through product redesign for the circular economy.

Some companies are partnering with start-ups that have developed innovative technologies to tackle environmental challenges. Loop Industries, a 2015 start-up, developed a technology that depolymerizes all polyethylene terephthalate (PET) plastics and fibers, regardless of dyes, additives and impurities, into virgin quality PET plastic.[30] Partnering with several major consumer packaged goods companies, Loop Industries is already capturing part of the growing circular economy market.

And where no eco-friendly alternative exists, chemical manufacturers can strategically partner with downstream companies to share the risk and reward of co-innovation. Target, for instance, has committed US$5 million to green chemistry innovation by 2022.[31] As partnered innovation initiatives multiply, chemical companies could benefit greatly and help secure future demand.

Case Study

Circularity in action: Eastman

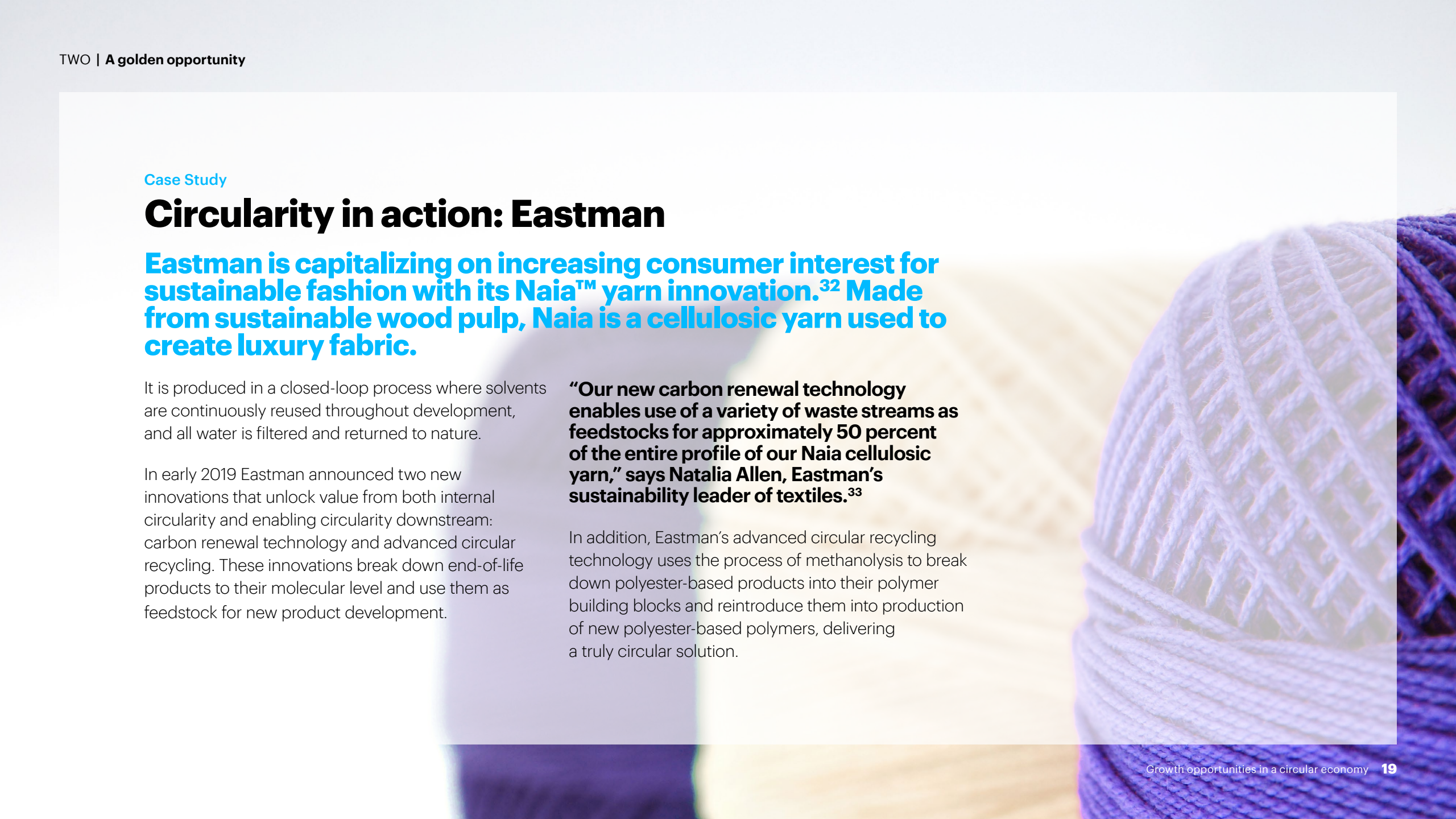
Eastman is capitalizing on increasing consumer interest for sustainable fashion with its Naia™ yarn innovation.[32] Made from sustainable wood pulp, Naia is a cellulosic yarn used to create luxury fabric.

It is produced in a closed-loop process where solvents are continuously reused throughout development, and all water is filtered and returned to nature.

In early 2019 Eastman announced two new innovations that unlock value from both internal circularity and enabling circularity downstream: carbon renewal technology and advanced circular recycling. These innovations break down end-of-life products to their molecular level and use them as feedstock for new product development.

"Our new carbon renewal technology enables use of a variety of waste streams as feedstocks for approximately 50 percent of the entire profile of our Naia cellulosic yarn," says Natalia Allen, Eastman's sustainability leader of textiles.[33]

In addition, Eastman's advanced circular recycling technology uses the process of methanolysis to break down polyester-based products into their polymer building blocks and reintroduce them into production of new polyester-based polymers, delivering a truly circular solution.



Three

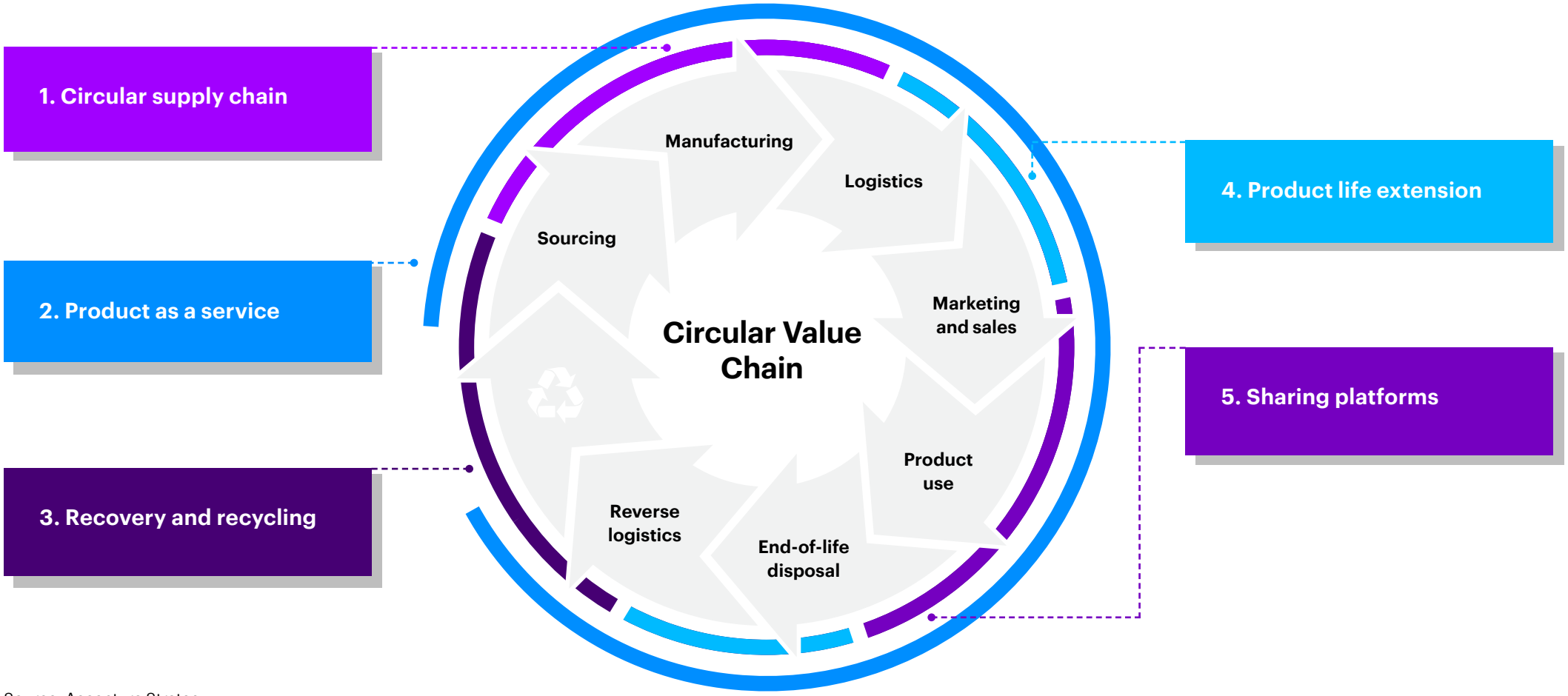
Shifting to new circular business models

As the chemical industry landscape continues to evolve, new business models are emerging, creating abundant opportunities to capture value and drive growth at every stage of the circular economy.

By improving their internal operations and responding to downstream industry demands—while leveraging new technologies and partnerships—chemical companies can adopt these approaches to turn disruptive change to their advantage.

Figure 5

Five business models for growth in the circular economy



Source: Accenture Strategy

New business models, new opportunities

1. Circular supply chain

With this model, companies focus on eliminating toxic, single-use or other non-renewable inputs across their supply chain. Their internal processes switch to renewable energy and replace single lifecycle inputs with sustainable bio-based or fully recyclable input material during manufacturing. BASF, for example, has developed a biomass balance approach to reduce the use of non-renewable resources.[34] By using sustainable biomass feedstock like food waste, for example, it maintains product consistency while reducing fossil fuel use, avoiding feedstock price volatility and limiting greenhouse gas emissions.[35]

2. Product as a service

Here, companies offer product access but retain ownership. Physical assets like cars and clothing are often thought of with this model. However, chemical leasing is a great example of how the chemical industry can shift to service-based sales that focus on selling function and quality rather than volume. By monetizing the value of these product outcomes, the industry can help downstream companies embrace circularity while reducing internal costs. For example, SAFECHEM, a chemical leasing provider initially founded by Dow, helps customers decrease the usage of metal cleaning solvents by up to 93 percent and reduce energy use by up to 50 percent through its closed-loop, circular system.[36]

3. Recovery and recycling

Salvaging useful resources and/or energy from disposed products or byproducts creates a huge opportunity, particularly to treat and repurpose plastic material. In India, Dow has collaborated with the government and local asphalt plants to transform 100 metric tons of collected plastic waste into 40 kilometers of roads.[37] Not only did this divert plastic from landfills, it gave the plastic a second life that will likely last decades.

New business models, new opportunities (cont'd)

4. Product life extension

By developing more durable product offerings, chemical companies can extend the life of products downstream without the need for modification, such as durable PET bottles. They can also partner with brands and retailers to create products with a longer lifecycle than current alternatives. Chemours and Colmar worked together to create the next generation of skiwear.[38] Using Chemours' Teflon EcoElite™—a repellent finish made from 60 percent renewably sourced, plant-based materials that is three times more durable than other non-fluorinated repellents—Colmar was able to meet the demands of its eco-conscious customer base with high-quality, longer-lasting products, which ultimately became one of its most successful collections.[39]

5. Sharing platforms

Product utilization can be optimized by leveraging shared use, access and ownership via online marketplaces where companies can trade inventory. While sharing platforms are often considered for finished consumer goods, they can also be applied to the chemical industry. For example, chemical companies could develop an artificial intelligence (AI)-enabled digital platform offering downstream manufacturers tailored services, say to optimize reuse solutions for excess chemical product, determine the best chemicals for specific reuse applications and engage with experts on circular product design. This could be invaluable in helping brands and retailers to reformulate and innovate fast in response to changing consumer demands.

Four

Pivoting toward a circular chemical industry

With so much potential, how and where should a chemical company start? First and foremost, they need a clear strategy that balances protection of core business revenues with the need to innovate for future demand.

With this approach they can successfully pivot to a more circular future, by seeing sustainability as a growth enabler that's creating opportunities for customers, brands, retailers and companies to collaborate in new ways to unlock value from the circular economy.

Customers and consumers

Consumers are in a powerful position to drive continued change, with 43 percent of survey respondents saying they've already participated in a product takeback program and 95 percent saying they'd be willing to take containers back for refill.[40] This is good news for companies like TerraCycle's Loop, a global circular shopping platform designed to eliminate the idea of waste by transforming the products and packaging of everyday items from single-use to durable, multi-use, feature-packed designs.[41]

By demanding clean, sustainable products and demonstrating their willingness to pay and participate in the circular economy, consumers will be key influencers in driving a response across the value chain from brands and retailers to manufacturers and regulators.

43%

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Brands and retailers

Brands and retailers have the power and scale to significantly reduce their negative environmental impact.

By increasing their commitment to sustainability, they can build consumer trust, reduce material costs and drive growth in their core business.

And through circular product design they can leverage their purchasing power to drive more responsible business practices upstream.

Chemical companies

Chemical companies are uniquely poised to enable circularity, quicken its adoption and drive positive environmental change—while strengthening their own competitiveness, reducing costs and accelerating growth. But they must respond fast to new regulations, take proactive steps to anticipate sustainability trends and ensure their portfolios offer the diversity to withstand disruption.

As technical experts, they can partner with downstream companies to advise on cleaner ingredients and provide clarity on green and circular chemical alternatives. Doing all this, they can strengthen their core business, develop innovative offerings that enable circularity and continuously pivot to capitalize on new opportunities.

Five

Get set to embrace circularity

Despite complex challenges, environmental pressures and the pace of change, there's a bright future ahead for chemical manufacturers.

They can turn disruption to their advantage and embrace the new—new technologies, new business models, new products and services, new partnerships and new customers.

While the type and quantity of chemicals required by brands and retailers is changing, chemicals will always be vital to production of goods and services.

As we've seen, a changing consumer mindset and even a willingness to pay more for products designed for sustainability are opening up exciting new opportunities for chemical companies. They need to be ready and willing to shift their strategic focus to innovations that tap into the potential of the circular economy.

And the time to start is now.

About the research

Accenture conducted a global quantitative online survey of 6,000 consumers. The purpose of the survey was to identify consumer purchasing and consumption habits regarding different types of packaging and products, as well as consumer views related to recycling and reuse of materials.

Respondents were ages 18 to 70 and covered a broad range of employment, education and income levels. They also had primary or shared responsibility for making purchase decisions in their household for everyday products and services.

The survey was conducted in April 2019 in the following 11 countries: Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, the United Kingdom and the United States.

Conducted April 2019

6,000 respondents, ages 18–70

Decision makers for household purchases

11 countries across Asia, Europe and North America

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Sofia Guerriero is a consultant in Accenture Strategy's sustainability and trust practice. She works primarily with consumer goods companies, helping to assess their sustainability maturity, recommend leading responsible business practices and develop future growth strategies. She holds a bachelor's degree in global studies and Italian from the University of Illinois at Urbana-Champaign and is currently pursuing an MBA at the University of Chicago's Booth School of Business.

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