accenture

The future of demand

Opportunities for chemicals to capture growth

Executive Summary

During the last 150 years, the chemical industry has provided innovative solutions to customer industries and consumers, helping drive progress and new demand in everything from packaging to consumer electronics to agriculture. While we expect current patterns to continue shaping demand during the next two to three years, more importantly, what will chemical demand look like in 10 to 20 years?

Research by Accenture shows that demand for sustainable chemical products has been growing, and we expect that trend to continue. In fact, we found that more than half of consumers are motivated to purchase eco-friendly products—both now and in the future[1]—and are often willing to pay a premium price for them. Manufacturing and consumer goods companies are responding with innovations that address this demand, and they are also willing to pay a premium for eco-friendly products. These consumer and industry trends will foreseeably shape the future of demand for the chemical industry.

The demand for sustainability-related offerings is twofold: sustainable chemicals for the production of eco-friendly products and conventional chemicals used to manufacture products that reduce environmental impact, such as solar panels or electric vehicles. We found that sustainability-related segments within industries served by the chemical industry are growing faster than conventional ones.

Meanwhile, we estimate that demand for sustainability-related chemical products will increase by about 70% by 2028, projected to reach $570 billion.[2] This increase reflects an 11% compound annual growth rate (CAGR), expanding at a rate 4.5 times greater than the 2.4% CAGR projected for conventional products.[3]

Given changing demand and the fact that price premiums for sustainability-related products may not be shared across the value chain, chemical companies will need to revise how they go to market, from value propositions to new business models.

Drawing on our experience and in-depth research, we've identified three key actions to help chemical companies succeed in this fast-changing landscape:

1. Accelerate innovation by reinventing R&D, based on digital, data and AI
2. Develop and communicate a compelling value proposition, including traceability and transparency
3. Build value-chain partnerships

This report summarizes research on consumer preferences, trends in chemical customer industries and the size of the future opportunity for the chemical industry. It also explores how chemical companies can innovate to meet the growing call for offerings that lower consumers' carbon footprint and how they can secure part of related price premiums.

4.5X

faster projected growth in demand for sustainability-related chemical products compared to conventional products[4]

This report is part of our series of insights exploring how chemical companies can leverage sustainability-related demand. It delves into future demand and strategies for capturing it. Our previous report, **Where's the money in sustainability for chemical companies?**, examined managing the supply of less carbon-intensive products.

Consumers demand eco-friendly products

An Accenture survey of 25,000 consumers across 22 countries found that more than half (51%) of respondents prefer to buy environmentally friendly products and services.[5]

Additionally, 70% consider the ease of recycling when making purchasing decisions.[6]

A separate Accenture consumer survey revealed that 65% of respondents prefer brands that are eco-friendly, have green credentials and invest in sustainability. (Figure 1)

Figure 1:
Sustainability shapes consumer purchasing and lifestyle choices

Source: [1]Accenture Green Consumption Survey 2023, [2]Accenture Global Consumer Survey 2022, [3]Accenture Global Consumer Pulse Survey 2020-2021

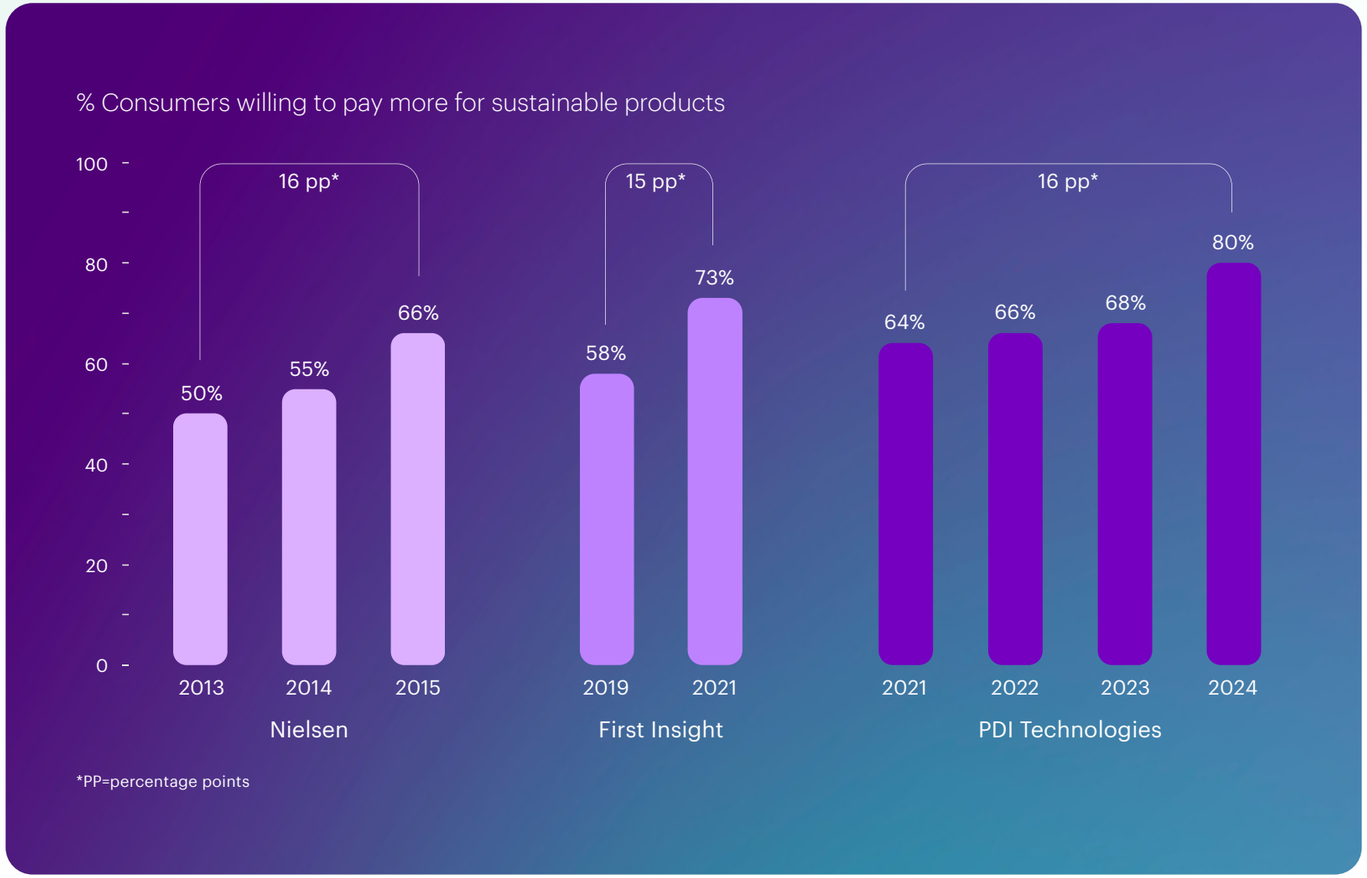
Particularly intriguing, our analysis of various reports revealed that consumers are increasingly willing to pay a premium for sustainable products, with this readiness growing in recent years.

For instance, a US survey by PDI Technologies showed that the share of consumers willing to pay more for sustainable products grew by 2 percentage points from 2022 to 2023 and by 12 percentage points from 2023 to 2024.[7]

Data from others, including Nielsen, supports this trend, indicating a significant increase in consumer willingness to pay more for sustainable products. (Figure 2)

The combination of rising consumer preference and increased willingness to pay more for eco-friendly products provides a clear sense of future demand.

Figure 2:
Several studies reveal a growing willingness among consumers to pay a premium for sustainable products



Source: Accenture analysis based on secondary publications across regions and consumer groups.

Chemical customer industries commit to meet consumer preferences

In response to this shift in consumer demand, business-to-consumer (B2C) companies across sectors are taking notice and action. Companies are developing offerings that align with these preferences. They are also setting and publicly communicating their sustainability-related goals and commitments.

Consider: L'Oréal pledges that 95% of ingredients in its formulas will be bio-based, derived from abundant minerals or from circular processes, by 2030.[8] H&M Group has committed to using recycled or sustainably sourced materials for 100% of its packaging by the same year.[9] In addition to acting as suppliers, chemical companies can also position themselves as strategic partners, helping customers meet their sustainability commitments.

Moreover, as these companies strive to meet their decarbonization targets, the demand for sustainability-related chemical products and solutions will continue to grow. **Overall, we project demand for sustainability-related chemical products will rise from $340 billion in 2023 to $570 billion by 2028.[10]** This almost 70% anticipated increase, with an 11% CAGR, represents a significant growth and innovation opportunity. It outpaces the 2.4% CAGR projected for conventional products.

Customer industries show high growth in sustainability-related business segments

Today, the chemical industry's products and solutions contribute essential features to a wide array of products, such as pigments and colors for decorative paints, packaging that preserves food, active ingredients for pharmaceuticals, antiviral disinfectants and materials for wind turbine blades. While some industries consume more chemicals, such as automotive or construction, every industry relies on chemical offerings in their manufacturing processes or as key ingredients in their products and solutions. (Figure 3)

Industries have increased their consumption of chemicals, led by innovations that help meet consumer preferences for eco-friendly products, differentiate offerings and increase the effectiveness and sustainability of manufacturing processes. **Our research indicates that sustainability-related segments within industries served by the chemical industry are experiencing significantly higher growth than conventional ones, and we expect this trend will continue to shape future chemical demand.**

Figure 3:
The chemical industry underpins all others

Source: OECD input-output table, Oxford Economics (September 2024), Accenture analysis. For global data, the 3Y average % is calculated for key regions or countries: US, EU25 (excluding Malta and Cyprus), Japan, South Korea, Taiwan, Brazil, India, Russia, Saudi Arabia and China.

Analyzing global sales growth from 2021 to 2023 for 69 companies across 10 industries, we found that sustainability-related segments consistently outpaced overall growth,[11] including conventional segments.[12] (Figure 4)

For example, looking at global sales from 2021 to 2023 as noted above:

- In textiles, products that were recycled, bio-based or had a low greenhouse gas footprint grew in double digits, whereas the conventional textile segment showed negative growth.
- In the consumer electronics sector, conventional products experienced negative growth, while sustainability-related segments, such as products with recycled or renewable materials, saw double-digit sales increases.
- In the automotive sector, global sales for electric and hybrid vehicles grew almost 40%, whereas overall growth was slightly less than 10%, slowed down by conventional product growth.
- Home and personal care products with bio-based/sustainable ingredients drove a growth rate more than double that of overall growth, meaning conventional segment growth was much lower.
- The paper sector showed negative growth in conventional segments, whereas sustainability-related segments saw double-digit growth.

The top five sectors for sustainability-related growth were automotive (37.9%), utilities (16.6%), textiles (16.0%), home and personal care (14.2%) and paper (13.3%).[13]

Figure 4:
Sustainability-related segments outpace conventional industry growth

Notes:
- Data was derived from a sample of 5+ representative companies within each industry.
- To estimate the growth of sustainable or recycled/renewable or bio-based product sales, three types of data were considered based on information availability: sustainable material or recycled content penetration, circular or sustainable solution revenue, sustainable product units sold (e.g., EVs,), and sustainable sourcing.
- Overall growth was derived from Oxford Economics gross output (sales), (Nominal, $B) for all industries except **Home & Personal Care and **Packaging. For the latter industries, the revenue growth of representative companies was considered.

Source: Accenture analysis based on data derived from company annual and sustainability reports, Capital IQ and AlphaSense.

Maturing sustainability-related demand

High sales growth but small overall product volume is often characteristic of emerging or new markets. However, our research shows that sustainability-related business segments in various chemical customer industries have matured beyond this initial stage.

We found that several sustainability-related business segments have achieved significant size and importance in the overall business portfolio. For example, sustainability-related products in the utilities, automotive and construction sectors accounted for 39%, 37% and 35% of the overall business portfolio in 2023, respectively. (Figure 5)

These substantial and well-established sustainability-related business segments are shaping chemical demand today. As this shift toward sustainability-related business segments continues, it will increasingly shape future chemical demand.

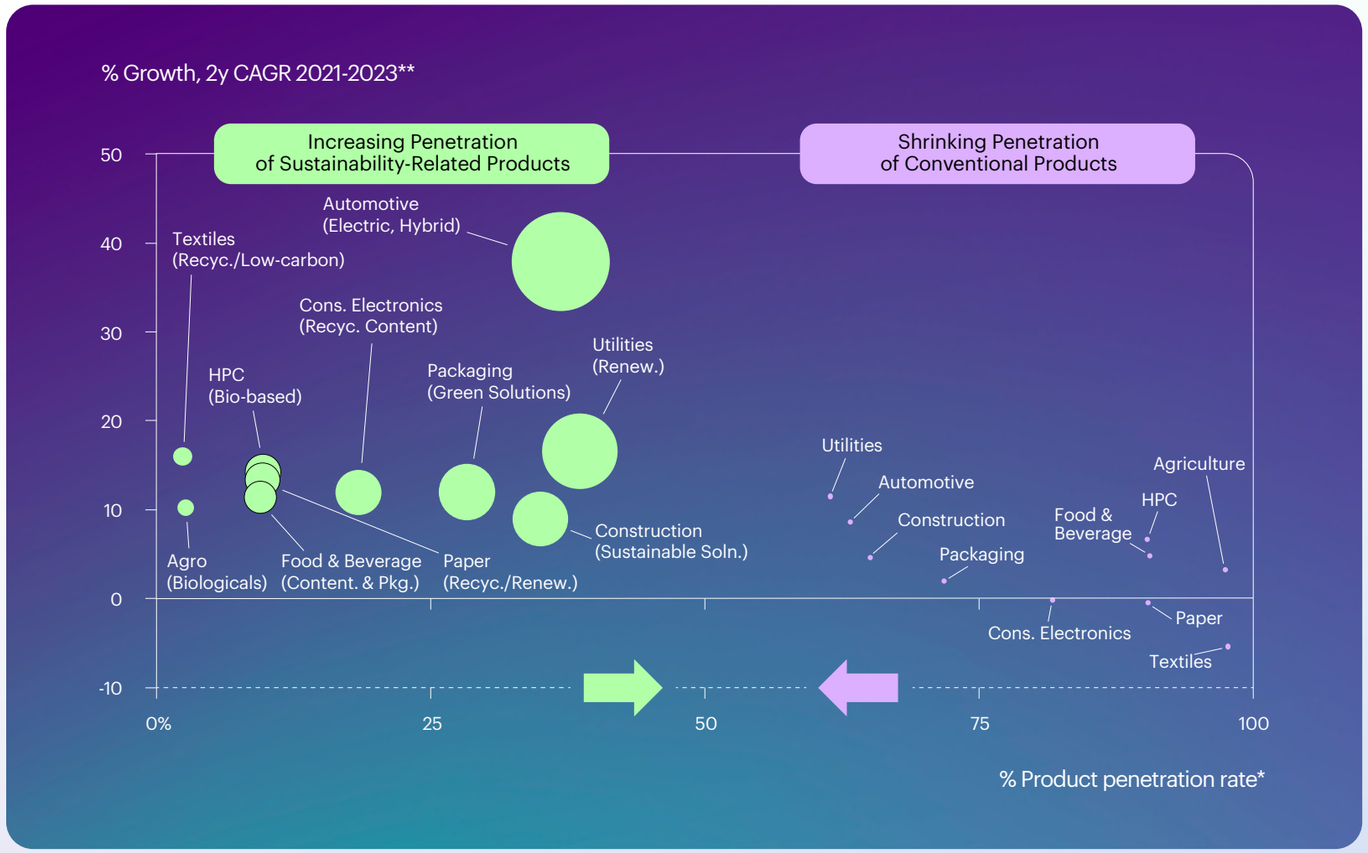
Consumer products sector makes sustainability-related changes

A closer look at the consumer products sector reveals many instances where sustainability-related products and solutions have replaced conventional ones. Environmentally friendly adjustments can easily be overlooked: packaging changes, ingredient substitutions, fiber alterations in cloth or modifications in casting.

For example:

- Danone removed the polyethylene terephthalate (PET) labels from its Actimel drinks to reduce plastic usage and facilitate recycling. Informational text is now engraved directly on the bottle, reducing plastic use by about 135 metric tons annually—the equivalent of more than 270 million bottles.[14]
- Unilever formulated a new dishwashing liquid with a renewable, biodegradable foaming ingredient, replacing surfactants derived from petrochemicals.[15]

Figure 5:
Sustainability-related demand shows higher growth and increasing penetration



Bubble Size: Absolute Growth (Delta penetration rate 2021-2023)
Overall market is growing slowly. Conventional product penetration is decreasing; thereby resulting in negative absolute growth.

- **Sustainable Products**
- **Overall**

*Percentage share of sustainability-related & conventional products in respective industry, 2023
**CAGR calculation for 2021-2023 as per below methodology

- Sustainable Products: Data derived from 5+ representative companies per industry
- Overall: Data derived from Oxford Economics gross output (sales), (Nominal, $B) for all industries except Home & Personal Care and Packaging. For the latter industries, the revenue growth of representative companies was considered.

Source: Accenture analysis based on data derived from company annual and sustainability reports, Capital IQ and AlphaSense.

How to capture the future of demand

Future demand will foreseeably be shaped by increasing consumer preference for eco-friendly products and their willingness to pay more for them, alongside industries' commitments to reduce greenhouse gas emissions in their products and production processes.

This shift will involve increased use of recycled and bio-based feedstocks and growth in sustainability-related business segments.

The chemical industry plays a vital role today and will continue to do so in the future. On closer examination, it's clear that chemical companies can meet some of the future demand with existing products and solutions. However, capturing other aspects of this demand will require chemical companies to innovate, explore new approaches and business models and adopt advanced digital technologies, such as AI, including generative AI.

Drawing on our experience and in-depth research, we've identified three key actions to help chemical companies succeed in this changing landscape.

01 Accelerate innovation by reinventing R&D, based on digital, data and AI

Companies will need substantial innovation to meet future demand, driven by consumer preferences for sustainable products with low greenhouse gas emissions. Solutions will require more cost-effective and eco-friendly chemical processes, recycled and bio-based feedstocks and many other new features.

As innovation budgets remain constrained, a significant increase in innovation effectiveness is essential. The good news is that advanced digital technologies, such as generative AI, can increase average success rates for R&D projects by up to 70%.[16] These tools allow researchers to spend less time on repetitive, manual tasks such as data entry and literature review and more time on activities that create value such as collaboration and ideation. That means innovation is becoming more tech-enabled, predictive and prescriptive.

For example, lab-based experiments can shift to quantum-powered, virtual experiments. In-house R&D units are already transforming into innovation ecosystems that cultivate collaboration with external partners, bringing together chemists, data scientists and customers.[17]

Generative AI, for instance, can quickly search both structured and unstructured data, such as market reports and scientific literature, to assess the attractiveness of new concepts. AI-based analytics can also predict potential chemical properties, define new chemical formulations and provide recommendations for experiments.

In one case, a major chemical producer, teaming with Accenture, used generative AI to streamline patent analyses, enabling R&D teams to conduct patent search activities with improved accuracy in just a few hours instead of weeks or months. This advancement has led to more effective intellectual property filings and defense, as well as reduced product lead times. Additionally, these tasks were expanded to a broader set of R&D personnel, rather than a few senior team members, encouraging transparency and collaborative learning among researchers.

02 Develop and communicate a compelling value proposition, including traceability and transparency

Sustainable chemical offerings face an inherent challenge: While the chemical molecule itself may remain unchanged, the feedstock, greenhouse gas footprint or other sustainability-related features may differ. Likewise, although product performance may be the same, the inputs, production processes or other elements of the product have been modified to be more environmentally friendly, providing added value. None of these improvements may be immediately apparent to buyers.

Consequently, it's critical for chemical companies to develop and communicate a value proposition that provides full transparency and traceability for differentiated sustainability-related features. **This evidence is especially important when companies are asking customers to pay a premium for eco-friendly offerings.** Traceability helps to build trust with consumers, making it clear that no counterfeiting or greenwashing[18] has occurred. It also helps chemical companies justify partaking in a share of the premiums paid by consumers.

From a technology perspective, a variety of solutions can provide traceability:

- **Blockchains:** Create a transparent, tamper-proof ledger that records the chemical production process, making products highly traceable.
- **Digital product passports:** Offer information about a product's value chain, such as its origin, materials, manufacturing process, environmental impact and disposal or recycling recommendations.
- **Business networks:** Connect multiple companies within a supply chain through a digital platform, enabling them to share information and provide end-to-end traceability and transparency.

For example, a global chemical company sought to increase sales of circular products and solutions by improving its sustainability data and reporting. Working with Accenture, it created digital dashboards to track its renewable energy use, circular product sales and supplier sustainability risks. The company also established a data model for greenhouse gas reporting and developed a plan for carbon management, and environmental, social and governance (ESG) reporting. Overall, these efforts improved the reliability of the company's data, while also providing greater insight into its Scope 3 emissions.

03 Build value-chain partnerships

As highlighted earlier in our analysis, the chemical industry provides essential solutions to virtually all other industries, contributing ultimately to the performance, quality and innovation of countless consumer products. Consumers' eco-friendly preferences will shape future demand, encouraging companies across sectors to produce sustainable products. This shift will, in turn, spur the chemical industry to facilitate those innovations through its offerings.

Given this interconnected landscape, capturing the growth opportunity will require collaboration across the value chain. Co-creation, shared innovation, investment commitments and also risk- and profit-sharing will be essential.

Forming value chain partnerships will become more important to realizing the growth opportunity than solo efforts by chemical companies. These partnerships will be especially crucial as demand isn't static but will evolve and materialize through innovative, eco-friendly products and solutions.

For inspiration, we can look at an example from an adjacent industry: Shell, American Express Global Business Travel (AMEXGBT), Energy Web Foundation (EWF) and Accenture exemplify a productive value chain partnership. The group collaborated to boost green premiums by creating new green products and markets. They developed a green fuel platform, launching a digital solution to scale up the sustainable aviation fuels (SAF) market. This platform is the first commercially available digital book-and-claim solution that uses blockchain technology. It unites airlines, corporations, cargo players and SAF suppliers in one secure environment to capture demand.[19]

Collaborations for product and solution innovation can be formed with chemical customers, governments and with new partners such as technology companies or non-governmental organizations. In the US, the Department of Energy actively promotes and funds innovation across the value chain.[20]

The path to capturing growth from future demand

The chemical industry faces a substantial opportunity to capture the growing demand for sustainability-related products and solutions. As consumers increasingly prefer and pay more for eco-friendly products, industries are committing to reduce their greenhouse gas footprint, driving the need for sustainability-related chemical solutions. Chemical companies are innovating and changing to tap into this demand and secure their share of this market and the premium.

For more than 150 years, chemical companies have provided essential solutions for customer industries and consumers. Now, although the chemical molecule may remain the same, these companies have the opportunity to more boldly communicate the sustainability-related innovation around that molecule and the value-added benefits to their customers.

By taking actions such as accelerating innovation with advanced technologies, developing compelling value propositions with clear traceability and building robust value-chain partnerships, chemical companies can position themselves to seize a substantial portion of the projected $570 billion demand for sustainability-related chemical products by 2028.

Learn more:

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About the research

This study examined future demand for the chemical industry, focusing on both consumers and industries served by the chemical industry, which we called "chemical customer industries" or "customer industries." Our research included analysis of data from the Organisation for Economic Co-operation and Development (OECD), Oxford Economics, Factiva, earnings reports from 69 companies and surveys from Accenture and third-party organizations.

Methodology:

- To estimate the chemical industry's output/sales to end-user industries, we used OECD input-output data to calculate the percentage share of internal consumption within the chemical sector and other end-user industries **(Figure 3)**, based on a three-year average (2016–2018). This percentage was then applied to the 2023 gross product sales (nominal US$) of the chemical sector, as reported by Oxford Economics.
- We defined "sustainability-related products" as 1) those made from recycled, renewable or bio-based materials, or 2) those made from raw materials sourced through environmentally responsible practices, or 3) sustainability-enabling products that reduce environmental impact throughout their lifecycle by enhancing energy efficiency and lowering emissions.

We explored future demand by focusing on the following areas:

- To determine the influence of sustainability on consumers' intentions **(Figure 1)**, we analyzed Accenture's Green Consumption Survey 2023, Accenture's Global Consumer Survey 2022 and Accenture's Global Consumer Pulse Survey 2020–2021.
- To learn if consumers are willing to pay more for sustainable products **(Figure 2)**, we drew insights from surveys covering diverse regions and consumer groups, using reports from Nielsen, First Insight and PDI Technologies.
- To estimate growth for sustainability-related products **(Figure 4)**, we analyzed the CAGR for 2021–2023 for sustainability-related products across five or more representative companies per industry. For the automotive, electronics, construction and utilities industries, we focused on material usage and sales penetration. For the food, packaging, personal care and textiles industries, we studied market reports. For the agriculture and pulp/paper industries, we relied on company and industry reports. We based overall growth calculations on Oxford Economics GDP sales (nominal, $B). Additionally, we used revenue growth data from representative companies for the home/personal care and packaging industries.
- To estimate sustainable product penetration **(Figure 5)**, we analyzed company data focusing on material usage and sales penetration for the automotive, electronics, construction and utilities industries. For the food, packaging, personal care and textiles industries, our research included market reports. For the agriculture and pulp/paper sectors, we studied both company and industry reports. In evaluating electric/light-vehicle sales, our analysis centered on the US, mainland China and the European Economic Area. We defined conventional product penetration as "100% of products minus sustainable product penetration."

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