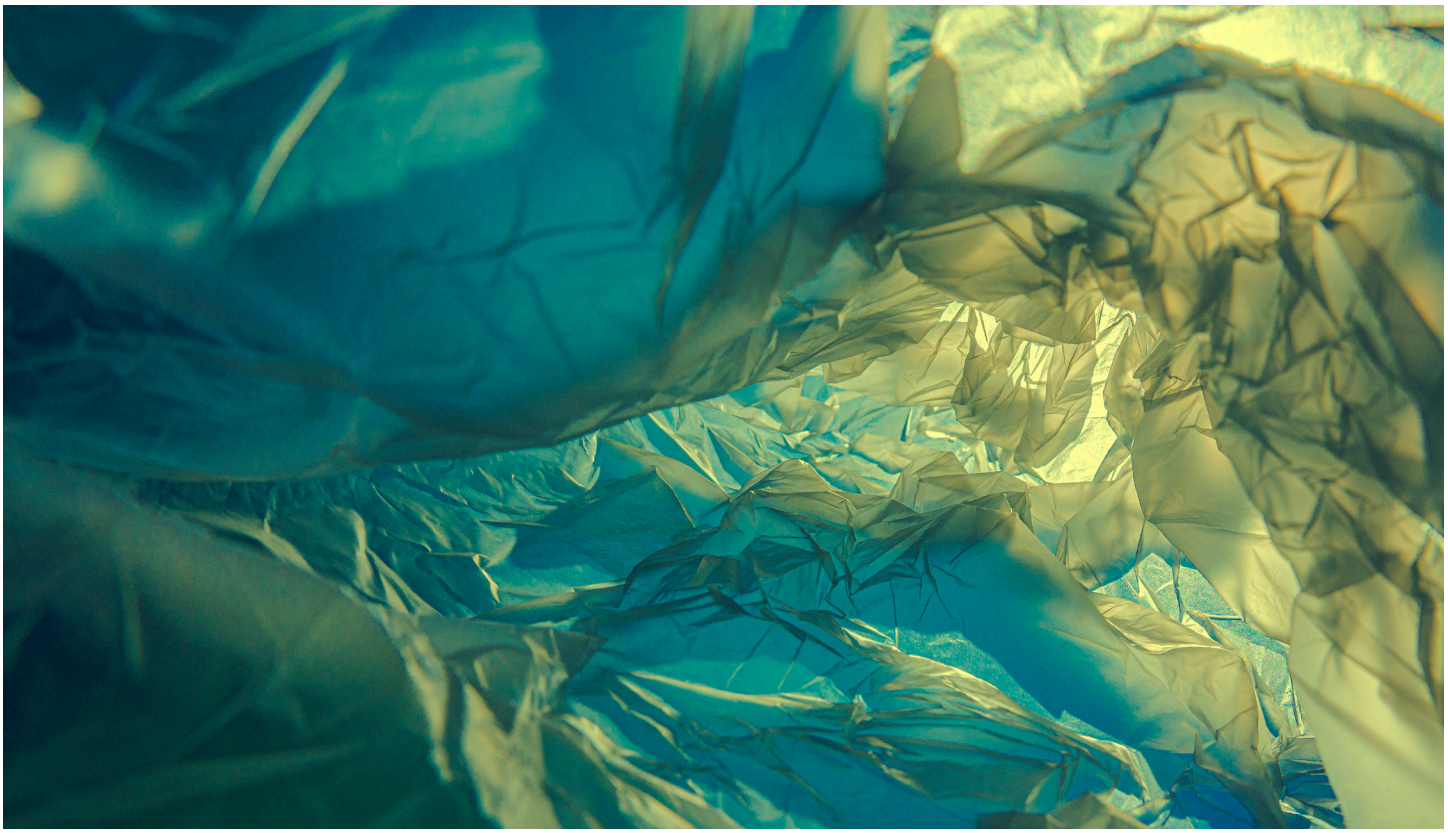

Finding the Sustainable Advantage in Chemicals

The push for greener operations and products provides new opportunities for chemical producers that invest in new capabilities.

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At a Glance

- The push for greater sustainability in chemicals is more than an exercise in compliance; it's creating new opportunities for chemical producers to sell green products at a premium.
- A better understanding of market trends, present and future costs, and how customers value green products is critical for determining how to approach the opportunity.
- Chemical companies accustomed to selling into commodity markets may have to develop new capabilities to build scalable businesses in green chemicals.
- Success requires better customer segmentation, more accurate pricing to value, setting long-term strategy under uncertainty, and more rigorous monitoring of the regulatory climate.

The global chemical sector is an essential centerpiece of modern economies, touching everything from fertilizers and fuels to petrochemicals and plastics. But the sector is increasingly under pressure for its large environmental footprint, being a heavy user of oil, gas, and other energy, and emitting more than 2 gigatons of greenhouse gases each year. Consumers, regulators, investors, and others are asking if it's possible to reap the same benefits from the sector, only with a lighter, more sustainable impact.

Across the broad and diverse chemical sector, every company will respond to this shift in its own way, depending on market position, portfolio, capabilities, and ambitions. Some companies may take a more defensive stance, adapting their operations and business just enough to comply with new regulations and customer demands.

Others may see the shift as an opportunity for growth in new markets and existing product lines. Many of these companies are already responding with bold and innovative approaches to new products and new ways to operate.

- **Greener production:** Reduce scope 1 and 2 emissions by switching to clean or renewable energy. Design products that use less materials—for example, rethinking packages to use less plastic.
- **Greener supply chain:** Reduce scope 3 emissions by encouraging suppliers to decarbonize their own inputs and operations and making changes to how employees and downstream users of products operate.
- **Green products:** Switch to biobased or recycled feedstock and design more circular products (biodegradable or recyclable) to reduce environmental impacts.

- **Green enablers:** Support the energy transition and broader sustainability goals to reduce overall impact, even if specific products are not themselves greener. For example, providing chemicals for batteries may not change a company's scope 1 footprint, but it supports the broader transition to electric vehicles.

- **New business models:** Companies may discover they are particularly good at some aspect of sustainability and begin to offer that service to others. For example, some industrial companies have developed unique skills in the management of fresh water and wastewater, and they have set up separate businesses around those capabilities.

While many companies are investing in sustainability, not all are capturing new value from these efforts. The leaders making these investments pay off define their ambitions clearly, gain a deep understanding of their customers' needs, and form partnerships that help put their plans into action.

Setting the ambition

Each company starts from a unique point. A clear understanding of market trends and costs helps to shape their ambition and investment levels. Along the value chain, companies like Neste have faced an existential crisis to their entire portfolio and have made large bets to shift to biobased alternatives. Others, including some major plastic resin manufacturers, see a future in which green chemicals live side by side with their legacy products for years while they build out sustainable value chains.

The products in a company's portfolio, its customers' needs, the relative cost position of alternatives today and in the future, and the regulatory landscape are all important factors in deciding whether to invest in green solutions as an industry leader, fast follower, or somewhere in the middle. Clarity and alignment on these issues help executives decide how much to invest over time and how far from the core business those investments may be.

How will customers value sustainability?

Once the ambition is set, the next step is for companies to get a better understanding of their customers and how they value sustainability. Specifically, what problems are their customers trying to solve, how will the new sustainable products help, and will they pay a green premium for it (or buy more of it)? Whole segments of customers may value sustainability differently: One segment may be more interested in carbon neutrality while another segment values a product that is all natural—and the perceived value determines the willingness to pay a premium greater than the actual value.

Chemical producers can tap into several different veins of opportunity here to address customers' needs.

- **Environmental impact:** Some customers focus on reducing industry impact by limiting greenhouse gas emissions or stopping deforestation. Unilever is exploring alternatives to palm kernel oil to ensure a traceable, deforestation-free supply of material to grow its surfactants business.

- **Natural products:** Other companies will focus on natural products that are good for the environment and consumers. Many personal care and consumer product companies want to produce and market more natural products. Lululemon, for instance, has partnered with biochemical company Genomatica to bring plant-based nylon to market, which could allow it to market athletic clothing that doesn't rely on petrochemicals.

- **Recycling:** Some will make products that are biodegradable or easier to recycle, or they'll make products from recycled material. Patagonia's NetPlus brand makes clothing from recycled fish nets, and it also uses recycled wool and polyester in its products.

- **Energy transition:** Opportunities also exist in selling products and services to customers affected by the global energy transition, including automakers, battery manufacturers, and battery material providers.

Customers will pay more for products that solve more of their own issues. Offering a sustainable product that makes up only a small part of a customer's solution will be worth less than one that solves most or all of a customer's issue. Consider the palm kernel oil example: It may make up only around 10% or so of a customer's soap product, but if it addresses the customer's concerns about deforestation, then it may be worth a lot.

Implementing the plan

Most new solutions require collaborations across the supply chain to help improve traceability, use alternative feedstocks, and develop new ways of processing materials. Partnerships also help share the significant financial risks that come with the development of new processes and products. Having a strong partnership strategy can drastically increase the speed of adoption, likelihood of success, and economic risk sharing with new investments.

A good example is the Houston Recycling Collaboration, a joint effort of industry (Cyclyx, ExxonMobil, FCC Environmental Services, and LyondellBasell) and the city to increase Houston's plastics recycling while ensuring a steady pipeline of end-of-life materials that can be used in producing recycled plastic. Exxon and LyondellBasell have pledged $100 million for a sorting and processing facility, and Cyclyx will provide the sorting and processing technology. Once operational, the facility could produce 150,000 metric tons of plastic feedstock annually in different blends to create recycled plastics. This partnership approach increases the availability of high-quality feedstock, shares risk between partners while leveraging the unique capabilities of each, and solves a wide range of other sustainability and business issues for all three partners.

In Chicago, Dow and WM (formerly Waste Management) are piloting a curbside recycling program for plastic films (including bags and wrapping) that are not included in standard plastic recycling. The companies hope to scale up the program to capture 120,000 metric tons of plastic film by 2025, providing Dow with a stable supply of recycled feedstock to use in its products.

Other new capabilities also may be required. Commodity chemical and plastic producers may excel at operations, but they might not be as good at developing keen insights about the customer's business, which is essential for understanding how customers may value the sustainable chemicals that often come with a premium.

Of course, significant change at this level can't succeed without a sustained effort and orchestrated push by senior management. Companies that are doing well in their transition get four things right:

- **Segment customers, and price to value.** Understand which customers put the greatest value on your products. When chemical companies understand the customers' business, they can tailor products and price them according to the value they can bring, or demonstrate how a new solution might help them create a new premium product.

- **Upgrade sales approach and tools.** Pitching new products may require new tools (such as models that demonstrate how a product reduces a customer's Scope 3 emissions) and incentives (such as higher commissions for new products). Some companies will set up a separate sales team to focus on new product lines.

- **Build a future-proof business.** The pace of scaling up will vary from one company to another, determined largely by ambition, customer needs, and regulatory conditions. Use established core capabilities to grow a new business that can supplement and surpass the existing one.

- **Monitor the regulatory climate.** Most executives would prefer not to wade into regulatory advocacy, but it's increasingly important to understand what regulators are considering to get out in front of big changes. As plastic bans become more common, the industry can position itself as an advocate of fiscally responsible, gradual change that avoids placing unrealistic cost burdens on customers and end-users.

Leading chemical producers already see tremendous opportunities in riding the green wave. Developing a deep understanding of the customer's business—in particular, their sustainability needs and goals—is the key step that informs the initiative. Other steps are important, too: Learning how to sell a premium green product, making the necessary partnerships, and pricing according to value are also essential for building new, more sustainable chemical businesses that may ultimately compete with and supplant their legacy operations.

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