How to be profitable and sustainable in the chemicals industry

EY Parthenon
Building a better working world

It is one of the essential conundrums facing chemicals and materials industry leaders today:

How can companies achieve ambitious new environmental targets while remaining profitable?

Mounting pressure from consumers, regulators and investors is driving chemical companies to seek ways to improve sustainability without harming the bottom line. Higher energy costs and rising carbon emissions associated with growing supply chain complexity also add to the urgency for companies to streamline ecologically wasteful processes and meet sustainability targets.

Companies are taking the demands seriously, and more organizations are making real investments — including venture capital initiatives, joint ventures and acquisitions — that are at least partly motivated by sustainability concerns. Both the dollar value and number of global transactions related to sustainability in the chemicals industry have significantly increased in recent years (Figure 1). Some manufacturers are even selling off carbon-intensive businesses to meet emission reduction goals and free up cash for investment in more eco-friendly businesses.

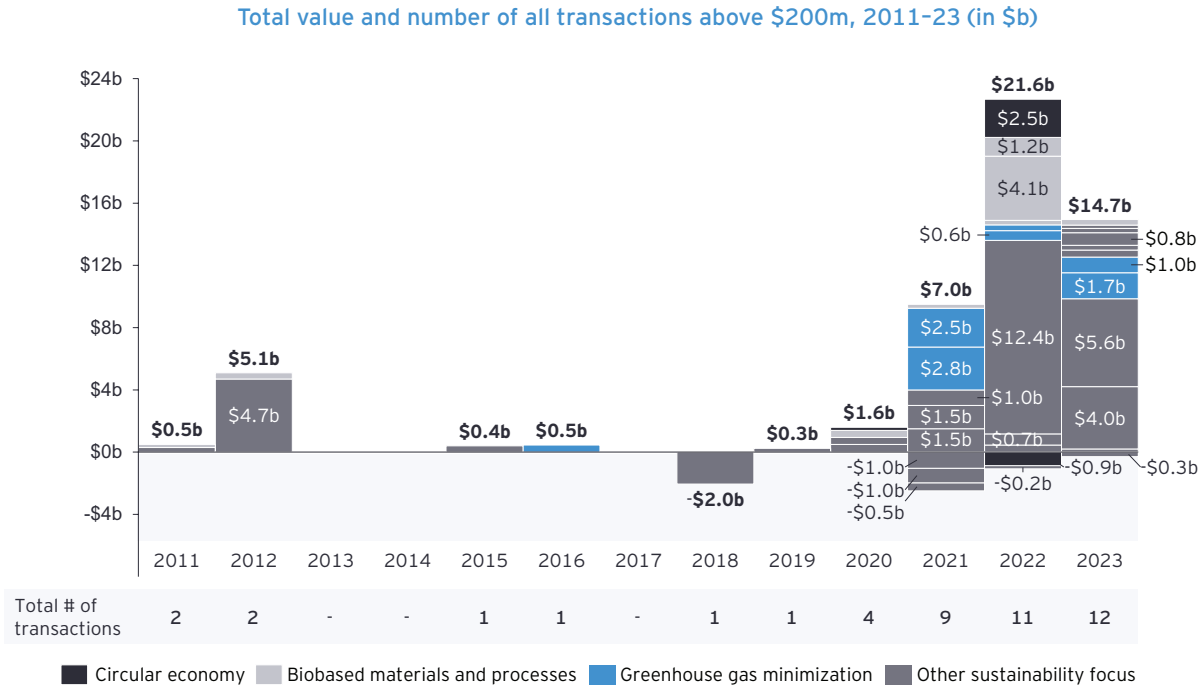
As sustainability takes a larger role in society and in the economy, opportunities to provide environmentally friendly offerings, such as digital manufacturing and carbon recycling, are growing. Companies that bet on such offerings at an early stage are now building on the leadership positions they established, and companies with relevant technologies are finding niches into which they can expand by adapting or augmenting existing capabilities.

Companies still face significant challenges to achieve environmental goals, however, including technological obstacles, high costs and regulatory hurdles. With so much at stake, it is reasonable to understand the useful lessons learned from their experiences so far.

Rather than tackle the challenges separately, chemical companies can handle them collectively by analyzing their market positions, identifying opportunities and adapting their business models to integrate sustainability into the organization's backbone.

EY-Parthenon professionals' experience working with companies in this area reveals several ways companies can update their business models to realize financial as well as sustainability goals. Each of the following case studies represents a different type of sustainable business model, and each demonstrates a combination of essential practices — the things companies must get right to successfully support the business model and its goals. These include focusing on their core customers, acquiring capabilities, creating business ecosystems, and designing and employing a supportive operating model.

Figure 1: Sustainability pressures have prompted significant capital activity in the chemicals industry. Global chemical deals above $200m in which sustainability was stated as part of the rationale, by sustainability category.



Note: Total sum value of each year is adjusted with divestment transaction values. Negative transactions refer to divested assets.
Source: Capital IQ; Factiva

Business models creating sustainability in the chemicals industry

Companies can create a lasting competitive advantage by building sustainability into the governance, policy and investment choices that define the business model. The result is a virtuous cycle of mutually reinforcing benefits – for example, company culture or customer loyalty – that can become embedded in the organization as lasting consequences that are difficult to imitate and resistant to short-term changes.

Described below are examples of financially viable, sustainability-oriented business models developed by leading manufacturers in chemicals and adjacent sectors, based on EY-Parthenon research, websites and media reports.

1

Business model	Sustainable products
	PPG, a manufacturer and distributor of paints, coatings and specialty materials, has introduced numerous sustainably advantaged products, such as paints produced from recycled materials.
Goal	Deliver high-quality, innovative, sustainable solutions.
Policy	Focus on circular product design, with a goal to reach 50% of sales from sustainably advantaged products by 2030, from a current share of 39%.
Governance	Establish a board-level sustainability and innovation committee.
Investment	Establish relationships with technology-driven partners to continue to develop the sustainable automotive coatings portfolio.
Lasting benefits	Provide solutions to increase customer retention and enable the sustainably advantaged product segment revenue to grow at 9% per year between 2018 and 2022.

PPG's sustainability initiatives are designed to help customers achieve their own environmental goals by promoting the circular economy, such as technology to capture and reuse industrial paint overspray, coatings made from recycled materials and products that are designed to be recyclable. The company is achieving these goals by investing in partnerships to access and develop sustainable technologies, such as its joint venture with Entrotech, a provider of innovative paint and film products that require less energy to manufacture.

2

Business model	**Sustainable services**
	Sandvik, a provider of products and services for mining, metal cutting and machining, expanded its digital manufacturing offerings, including a subscription-based business model, to help manufacturers meet their own sustainability goals.
Goal	Increase customer sustainability and operational efficiency.
Policy	Open-source solutions ensure data can be shared throughout the manufacturing process.
Governance	A decentralized operating model ensures products and services are aligned with customer needs.
Investment	▸ Acquire software and intellectual-property-related assets that enable delivery of digital manufacturing solutions. ▸ Implement continuous data collection and analysis to enable closed-loop production in which manufacturers can quickly identify and resolve issues, resulting in increased efficiency, lowered waste output and improved quality.
Lasting benefits	Sandvik's relationships with its equipment customers enable it to deliver on software opportunities, which tripled revenue from digitalized offerings from more than $100m in 2020 to $370m in 2022 and rose from 1% to 4% of overall revenue. The company projects total revenue from digitalized offerings to reach $600m by 2025.

Like PPG, Sandvik sees opportunities in helping its customers achieve sustainability targets, but with a particular emphasis on subscription-based services that help customers create more efficient, closed-loop production capabilities, as well as creating new revenue streams for Sandvik. Much of this has been achieved by acquiring companies with digital manufacturing technology that promotes efficient machine usage and accuracy, leading to less waste.

3

Business model	**Sustainable processes**
	LanzaTech, a "carbon recycling" company, out-licenses gas fermentation technology to help customers capture and monetize their waste carbon.
Goal	Change the way companies use and dispose of carbon to help create a "post-pollution future."
Policy	▸ License technology to companies that build their own facilities rather than provide the service directly, which limits capital investment requirements and allows LanzaTech to gain recurring revenues from a greater number of partners. ▸ Offer customers the opportunity to recoup their investment in just four to six years due to increased cash margins from reduced feedstock costs.
Governance	The chief sustainability officer is a member of the executive team. In March 2023, the company added three new board members with prior experience driving sustainable solutions to accelerate the transition to a circular carbon economy.
Investment	Maintain a proprietary, closed-source, gas fermentation technology, allowing the firm to charge royalty fees for its use.
Lasting benefits	Help customers capture carbon profitably and pay for that value through recurring royalties.

LanzaTech's business model, as licensor of carbon-recycling technology, fills a growing need, helping companies reduce their carbon footprints to meet targets. It goes even further, however, helping monetize carbon-rich gases by turning them into products, such as fuels and chemicals. The company has maintained its competitive edge through technology-based acquisitions and strategic partnerships while remaining focused on a business with highly synergistic elements – engineering services, equipment sales and technology licensing – all based on its core carbon-recycling capabilities.

4

Business model	**Value from data**
	Ecolab, a global leader in water, hygiene and infection prevention solutions, has created a global intelligence center, leveraging data from its network of internet-connected devices to provide valuable insights to customers.
Goal	Enable positive water impact by providing innovative solutions and personalized service to customers.
Policy	Measure "exponential return on investment" or "eROI," Ecolab's methodology used to demonstrate the value for customers through improved performance, efficiency and sustainability.
Governance	The intelligence center is embedded within the global sales organization rather than as its own unit, allowing full integration with existing data platforms.
Investment	Maintain a network of connected chemical technology, devices, platforms and experts in six data centers worldwide.
Lasting benefits	▸ A combination of smart equipment and related data insights enhances the value of the customer relationship. ▸ The company has reported increased customer satisfaction and retention attributable to its digital solutions.

Ecolab saw that the tremendous quantity of data available from its installed customer network of Internet of Things water-measuring devices could produce valuable insights that could be used to help its customers improve water usage efficiency. The company built its data center business using its existing technology to provide enhanced services for customers and create new revenue streams and value.

5

Business model	**Sustainable supply chain**
	LyondellBasell, a multinational plastics, chemical and refining company, uses digital ledgers to calculate and attribute recycled content to finished products in a traceable and auditable fashion.
Goal	Be the company of choice for environmental, social and governance (ESG)-minded investors, customers and brand owners.
Policy	Make circularity and carbon emissions data available to all supply chain stakeholders.
Governance	The company's Circular and Lower Carbon Solutions (CLCS) business is a separate business unit, with dedicated resourcing and accountability for results.
Investment	Leverage existing refining assets and adapt them for the CLCS business.
Lasting benefits	By being an early mover in this space, LyondellBasell is creating a network of loyal, ESG-minded customers and suppliers that will be difficult for competitors to replicate.

LyondellBasell's new CLCS business positions the company as not only a chemical manufacturer but also a service provider that helps other companies embed circular economies into their supply chains. The company achieved this by creating a business ecosystem that included upstream and downstream value chain players as part of its digital product passport pilot project that supports cyclical manufacturing in the supply chain. The company backed up its commitment by appointing board members with backgrounds in sustainability issues, an example of a company aligning different parts of the organization behind a common goal of sustainability.

Sustainable partnerships

In addition to the business model examples outlined above, several chemical and materials companies have succeeded by looking externally for strategic partnerships to advance sustainability initiatives in ways that complement the organization's business model.

Partnerships with competitors can help companies access shared capital and other resources to support sustainability projects that may not compromise competitive goals.

Chemical giant BASF partnered with other global chemical companies to collaborate on a catalyst and steam-reforming process with a lower carbon footprint. The partnership, which won an innovation award, enables firms to help their customers operate more efficiently and sustainably and minimize overall R&D costs.

Partnerships with government or quasi-government entities (e.g., public utilities) can help firms enhance the sustainability of pre-existing manufacturing processes for additional revenue opportunities.

Cities around the world have prioritized heat recapture from data centers and other facilities for use in their district heating systems, reducing the need for additional heat from carbon-emitting energy sources. Sandvik has installed heat pumps at a manufacturing facility in Sweden to participate in such a program with the city of Stockholm.

Partnerships with nonprofits can help firms leverage philanthropic dollars to facilitate community engagement, creating social benefits that otherwise may not be profitable to implement.

Nexus Circular, an advanced recycling company, outsources collection of hard-to-recycle plastics to the materials recycling nonprofit Live Thrive. Nexus Circular then uses proprietary technology to convert the collected plastic into high-quality feedstocks for petrochemical companies, such as Shell and others.

Partnerships with consumer products manufacturers can provide sustainable technology to those companies, as well as help smaller chemical manufacturers build a brand.

Avantium, a chemical provider, has developed technology to convert plant-based sugars into chemical and material building blocks. The firm has entered into an agreement with German consumer goods company Henkel to make polyurethane adhesives for applications in consumer products. Through partnerships like these, Avantium has grown enough to build its own commercial production facility.

Critical components of sustainable and financially viable business models

Companies seeking to transform their business model based on sustainability can start by identifying existing opportunities – based on the company's existing technology and capabilities – to help corporate and end-use customers reach their own sustainability goals. Key steps include the following:

1. Outline a vision for a profitable, sustainable future that is built on the company's existing capabilities.
2. Identify a sustainable business model that best fits with that vision.
3. Identify the capabilities that will be needed to make the transition, determine whether the organization should acquire or develop them internally, and embed the capabilities into the operating model.
4. Empower management, employees, the board of directors and other stakeholders to execute the transition in a lasting way.

While the case studies highlight different approaches — for example, acquiring new technologies or creating partnerships — companies typically pursue a blend of leading approaches. These can include focusing on the core business, creating supportive business ecosystems, acquiring appropriate capabilities and creating an operating model that supports the business model.

What companies need to get right

Focus on the "core"

Rather than creating ancillary offerings, successful companies should build durability into their core businesses. Companies add the most value by offering integrated solutions for their core customers.

Example:
Ecolab built its global monitoring system on top of its pre-existing platform of internet-enabled water-monitoring devices. In doing so, it created a service that integrates seamlessly, provides additional customer value and has high switching costs, further enhancing the sustainability of recurring revenues.

Acquire capabilities

Acquisitions of intellectual property and key capabilities can be an expedient way for companies to improve sustainable offerings while strengthening market position.

Example:
Sandvik launched a new solution for machining ball valves that combined its existing product with newly acquired toolpath optimization technology. The solution increased productivity by three times and improved tool life by more than 20%, positioning Sandvik as a market leader in energy and material savings for customers.

Create ecosystems

Engagement with adjacent segments of the value chain can strengthen a company's market position while also giving the firm more control over production inputs to ensure sustainability throughout the value chain.

Example:
PPG invested in paint and clear film solutions for automotive and industrial customers by creating a joint venture with a provider of technology-driven film solutions. The strategy has accelerated commercialization of the company's paint and film products while delivering significant sustainability benefits.

Design the operating model

The organizational structure, governance, processes, people and technology must all be aligned toward the same goals to successfully make the transition to a sustainable business model.

Example:
BASF provides centralized administrative and technical services for six decentralized product-oriented operating divisions. It has also established 60 strategic customer networks. This structure allows business units to drive sustainable solutions tied to customer needs while ensuring technical excellence.

Summary

By embedding sustainability into each component of the business model, firms can build virtuous cycles of company and stakeholder benefits that can lead to long-term competitive advantage. Several companies in chemicals and adjacent sectors have set examples by developing new business models that achieve financial gains while making progress toward their sustainability goals. Successful approaches include creating sustainable products, services and supply chains; monetizing data; and developing strategic partnerships that promote sustainability.

Sources: Finishing and Coating; Indian Chemical News; S&P Capital IQ; company websites, annual reports and press releases

Contact

Shahid Murtuza
Principal, EY-Parthenon
Ernst & Young LLP
shahid.murtuza@parthenon.ey.com

Federico Pulvirenti
Director, EY-Parthenon
Ernst & Young LLP
federico.pulvirenti@parthenon.ey.com

Ellen Shadburn
Consultant, EY-Parthenon
Ernst & Young LLP
ellen.shadburn@parthenon.ey.com

McKay Rytting, Krista Su, Paige Hagen and Olivia Shaw also contributed to this article.

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