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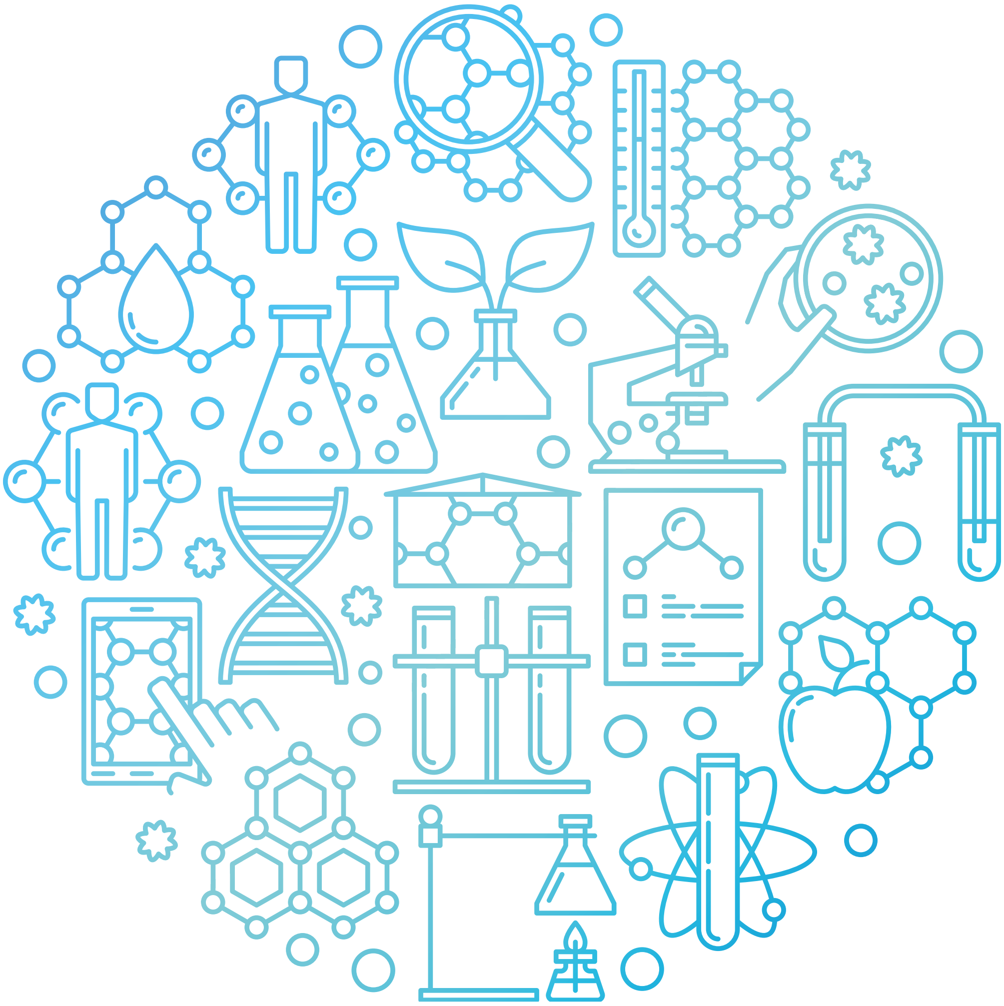


Chemicals Insights

From Haber-Bosch to high-tech: Europe's role in greener fertilisers

In the winter 2025/26 issue of Chemicals Insights, we highlight the role of European fertiliser innovations and the emerging trends in this field. We also explore the business sentiment indicators from our latest CFO survey and provide insights into the global M&A outlook and the latest M&A activity in the chemical industry.

Hot topics in the market – from Haber-Bosch to high-tech: Europe's role in greener fertilisers

The history of modern agriculture is strongly connected to the development of fertilisers. At the beginning of the 20^{th} century, the Haber-Bosch process marked a crucial milestone, enabling the industrial production of ammonia (NH_3), the key component of nitrogen fertilisers. The large-scale adoption of the Haber-Bosch process in the 1950s enabled the agricultural industry to feed the sharply rising global population as shown in Figure 1.

Europe is playing a crucial role in these developments in the fertiliser industry, accounting for over 20% of global fertiliser production today. It has continuously been at the forefront of designing sustainable alternatives to tackle environmental challenges of fertiliser usage such as water pollution, nitrate runoff and soil degradation. In recent years, the European Union, under its European Green Deal, has continued that path by aiming to reduce chemical fertiliser use by at least 20% by 2030. These stringent regulations are driving European producers to innovate and adopt environmentally friendly solutions, setting global benchmarks in sustainable agriculture.

What began as simple chemical formulations has evolved into a highly specialised and innovative industry. Modern fertilisers increasingly integrate precise and customised chemical compositions with delivery systems that provide specific nutrient profiles tailored to different soils and crops. These innovative solutions maximise nutrient uptake efficiency while simultaneously reducing environmental impacts such as nitrogen leaching or phosphate surplus.

Market overview

Faced with the dual challenge of feeding a rapidly growing global population and addressing environmental concerns, chemical companies worldwide are driving innovation in fertilisers. Governments across regions – from the European Union (e.g. the European Green Deal) to the United States, China, and South American countries – are enforcing increasingly strict regulations to reduce chemical inputs and promote eco-friendly alternatives. In response, companies are focusing on developing efficient and sustainable solutions to meet both regulatory demands and sustainability goals whilst maintaining or improving performance. Substantial R&D costs, strict regulations and strong competition from established players make entering the fertiliser market highly challenging.

The market for fertilisers has seen strong growth in recent years, driven by a growing population and food demand, technological advancements, urbanisation and land degradation. With less arable land available and the need to feed the expanding population, the demand for fertilisers continues to grow, ensuring their important role in the future of agriculture.

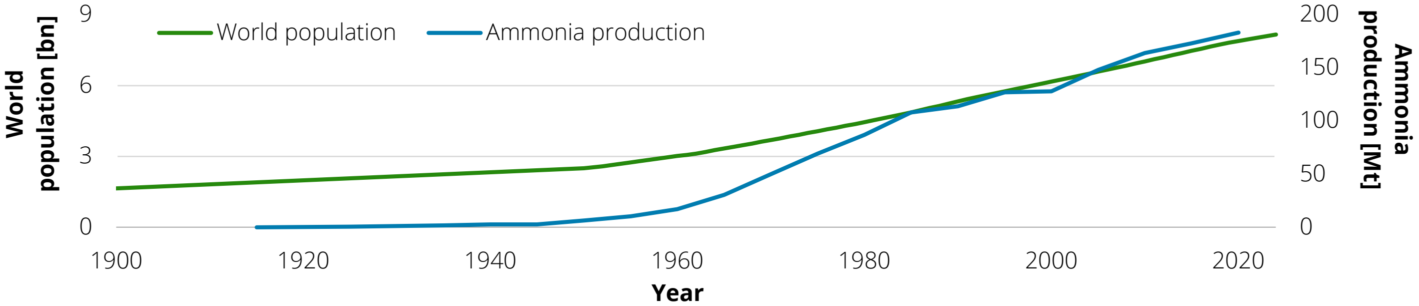
In 2024, the global fertiliser market was valued at approximately USD 208 billion. By the early 2030s, the fertiliser market is forecast to grow to USD 269 billion, representing a CAGR of 2.5%.[3]

The Asia-Pacific region (~50% volume market share) dominates the fertiliser market, accounting for the largest share due to its expansive agricultural base and rapidly growing population. This region is expected to maintain its dominance in the future, driven by increasing food demand and government initiatives promoting modern farming practices (e.g. the agricultural machinery subsidy in China). North America (~25% volume market share) and Europe (~20% volume market share) are experiencing slower growth due to stringent environmental regulations. They are shifting towards organic farming and innovative solutions, like precision agriculture.

Fertilisers – an introduction

A fertiliser is any material of natural or synthetic origin that is used in agriculture, forestry, horticulture, and private gardens to supplement the nutrient supply for the cultivated plants. Beside heat, light, air and water, plants require essential nutrients to support optimal growth. This necessity arises from insufficient nutrient availability in soils, further intensified by nutrient losses through crop harvesting and leaching. Targeted fertilisation helps to maintain long-term soil fertility, enhance plant growth, and improve both the quality and quantity of crop yields.

Figure 1: World population in comparison with ammonia production during 1800 – 2024 [1,2]



1) United Nations

2) K. H. R. Rouwenhorst, A. S. Travis, und L. Lefferts, "1921–2021: A Century of Renewable Ammonia Synthesis", Sustain. Chem., Bd. 3, S. 149–171, Apr. 2022

3) Calculation based on Global fertilizer market size 2020-2030| Statista

Macronutrients in fertilisers

The three main macronutrients in fertilisers are nitrogen (N), phosphorus (P) and potassium (K).

From a supply point of view, these three macronutrients differ fundamentally. Although nitrogen is ubiquitously available as a component of the atmosphere, the formation of ammonia (NH_3) as an intermediate stage requires large amounts of natural gas (in the form of methane); consequently, access to cheap natural gas has become one of the critical success factors for ammonia producers.

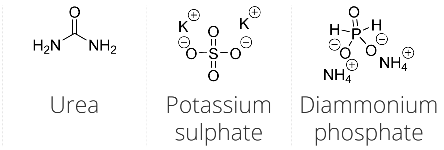
Unlike nitrogen, phosphorus and potassium are sourced through mining, making their availability highly dependent on geological conditions. While China currently leads global phosphate production with over 90 million tons in 2023, Morocco holds by far the largest known reserves with over 50 billion tonnes.[4,5] Potassium, by contrast, is primarily produced in five key regions: Canada, Russia, Belarus, Germany, and China, which together dominate the global potash supply.[6]

Categories of fertilisers

Fertilisers can be classified by their chemical composition into two main categories: organic and synthetic. Organic fertilisers are derived from biological materials such as animal manure, compost, green manure (from legumes), or agricultural waste like straw and corn stalks. By contrast, synthetic fertilisers are artificially manufactured compounds designed to deliver specific nutrients to plants.[7]

Most of the synthetic fertilisers are mineral salts, such as amides, sulphates or phosphates. The main representatives of these groups are presented in Figure 2. Due to their ionic bonding, caused by the electrostatic attraction between the oppositely charged ions, they are highly soluble in water. This makes them ideal for quick nutrient delivery to plants, as the dissolved ions (such as K^+ or PO_4^{3-}) can be immediately adsorbed by the plant roots. Besides mineral salts, some synthetic organic compounds, such as urea, also show high-water solubility. Urea is a small polar molecule with the opportunity to form multiple hydrogen bonds with water molecules. Due to its high nitrogen content and relatively inexpensive production costs, it has dominated the nitrogen fertiliser market for the last 50 years.

Figure 2: Chemical structures of urea, potassium sulphate and diammonium phosphate



The rapid nutrient release and high concentration of essential macronutrients are key advantages of synthetic fertilisers over organic ones, as they better meet the demands of global agriculture. Furthermore, they offer the possibility of precision farming.

Development of fertilisers today – a spectacle in three acts (so far)

Act 1: Synthetic fertilisers conquer the stage

Fertilisers have been used for thousands of years to enhance crop yields, with early farmers relying on natural sources such as manure and compost, which are considered organic fertilisers. By the 19th century, scientists had identified nitrogen as essential for plant growth, but natural sources were insufficient to support the rapidly expanding global population. As a result, a scientific race began to find a method for fixing atmospheric nitrogen. Fritz Haber succeeded in developing a process to convert nitrogen and hydrogen into ammonia using an osmium catalyst. Carl Bosch later scaled the method for industrial use, leading to the Haber-Bosch process, a breakthrough that revolutionised agriculture. During World War I in Germany, the development of the process accelerated to produce ammonia for explosives, replacing imported saltpetre that had been blocked by the British navy.

In the post-war period, ammonia plants were constructed across Europe, positioning the continent as a leader in the production of synthetic fertilisers such as ammonium nitrate (NH_4NO_3). The method gained global momentum in the 1950s, when falling production costs, driven by advances in steam reforming technology for hydrogen extraction from natural gas, made synthetic fertilisers more affordable. These developments played a key role in fuelling the Green Revolution, which dramatically increased food production worldwide. The Haber-Bosch process made synthetic fertilisers widely accessible and remains critically important today, with approximately 99% of ammonia still produced using this method.

As synthetic fertilisers, particularly nitrogen-based ones, became widely available and affordable, early usage patterns among farmers were relatively simplistic. Many followed the mindset of "the more, the better." At the time, the complex biochemical processes underlying plant growth were not yet fully understood, leading to excessive application of fertilisers that was frequently inefficient. Such practices often resulted in significant misapplication and overdosage.

Act 2: Improvement of soil science and fertiliser use

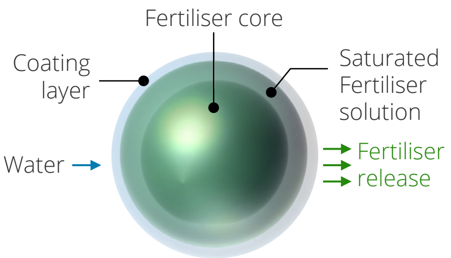
It was not until the post-WWII period that the second act began with research to focus more intensively on soil science and investigate the specific conditions that promote plant growth. The expanded knowledge of nutrients and soils has enabled new application techniques to be developed and the use of fertilisers to be optimised. At the same time, the problem of eutrophication caused by fertilisers that

4) Phosphate Reserves by Country 2025
5) Phosphate-2024-07-SME-ME-magazine_Redacted-1.pdf
6) Top 10 Potash Countries by Production | INN
7) F. R. Kulcheski, R. Côrrea, I. A. Gomes, J. C. de Lima, und R. Margis, "NPK macronutrients and microRNA homeostasis", Front. Plant Sci., Bd. 6, Art. 451, Juni 2015

had entered waterways and groundwater was recognised. Awareness of the issue was raised, and new regulations were established. Soil and plant-specific fertilisation strategies have been developed to reduce and optimise use. Beginning in the 1960s, newly developed liquid fertilisers and controlled release fertilisers (CRFs) were an important component of this. Both technologies represent a shift from traditional bulk fertilisation to targeted, efficient, and environmentally conscious practices and enhanced fertiliser efficiency.

A disadvantage of these more advanced fertilisers is that many of them have coatings that are still made from synthetic polymers (as described below) and do not biodegrade, potentially fragmenting into microplastics that contaminate soil and groundwater. However, biodegradable alternatives made from natural materials like polysaccharides (e.g. alginates) or proteins are emerging, offering safer and more sustainable options. New EU regulations are accelerating the shift toward microplastic-free agricultural products.

Figure 3: Example illustration of the mode of action of a controlled release fertiliser with coating layer. The illustration is based on works from Lawrencia *et al*.[8]



Liquid fertilisers can be absorbed by plants much faster than previous products and can be distributed precisely and in a targeted manner. They also enable fertigation, a method in which the fertiliser fertigation, a method in which the fertiliser is distributed via irrigation and can be dosed very precisely.

CRFs, on the other hand, are coated granules that enable nutrients to be released slowly over time, thereby reducing runoff and making them more efficient. These are usually enclosed by a polymer layer that acts as a semi-permeable membrane (Figure 3). Water can penetrate this membrane and dissolve the fertiliser core, forming a highly concentrated saturated solution layer. Driven by osmotic pressure, this solution diffuses through the membrane, releasing nutrients into the soil. The rate and duration of nutrient release are influenced by environmental factors such as pH, temperature and moisture.[9]

To further optimise CRF performance, smart variants are being developed that respond dynamically to changes in soil conditions, guided by physiological signals from the plant. This adaptive behaviour allows nutrient release to align with the plant's growth phases, improving nutrient use efficiency and reducing environmental impact. One such signal is a shift in soil pH, often caused by root exudates or nutrient uptake. To respond specifically to these changes, the polymer layer of the carrier can contain functional groups with acid dissociation constants, which are protonated or deprotonated depending on the pH value. In 2021, Dhystia Ferdajuna Fitri *et al*. showed in their studies that different polymers can be used for the polymeric layer.[10] Effective results for the slow release of fertilisers were shown for polysulfone polymers, polyacrylate/poly (silicone-co-acrylate), chitosan, polyhydroxybutyrate, κ-carrageen, polystyrene, and starch. With these polymers it was possible to increase agricultural yield with less fertiliser use.

To understand the mechanism of the slow release it is important to look at the functional groups of the polymeric layer that can change their conformation (and thus also the rate of released fertiliser) based on their ionic state. A functional group that is often involved in the polymeric layer is the carboxyl group, which remains in its protonated form R-COOH as long as the pH of the soil is below the specific pK_a value of the polymer (depending on the molecule pk_a between 4 and 5). In this state, hydrogen bonds can form between the carboxyl and other hydrophilic functional groups of the polymer. This means that the layers are stable and little to no active ingredient escapes to the outside. At a high pH value (more basic pH value) however, the carboxyl groups are primarily deprotonated as a carboxylate anion ($R\text{-}COO^-$), which leads to electrostatic repulsions. This changes the conformation of the polymer, causing it to swell and form pore channels, significantly accelerating the release of nutrients from the CRF.[11]

Alternatively, amino groups ($R\text{-}NH_2$) can be used, which, unlike carboxyl groups, repel each other at low pH values due to the positive charge of the protonated ammonium ion ($R\text{-}NH_3^+$). A notable example of a polyelectrolyte with amino functionality is poly *(N,N*-dimethylaminoethyl methacrylate) which is gaining attention in CRF research for its pH-responsive, cationic nature and tunable solubility, making it valuable for smart coatings and controlled nutrient release.

8) Controlled Release Fertilizers: A Review on Coating Materials and Mechanism of Release

9) IFA_CRF Backgrounder_0.pdf

10) Dhystia Ferdajuna Fitri, et. al. "Use of Polymers as Coatings for Slow Release Fertilizers." IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS), 16(1), (2021): pp. 22-31.

11) Journal of Applied Polymer Science | Wiley Online Library

Act 3: Future of fertilisers through AI and biostimulants

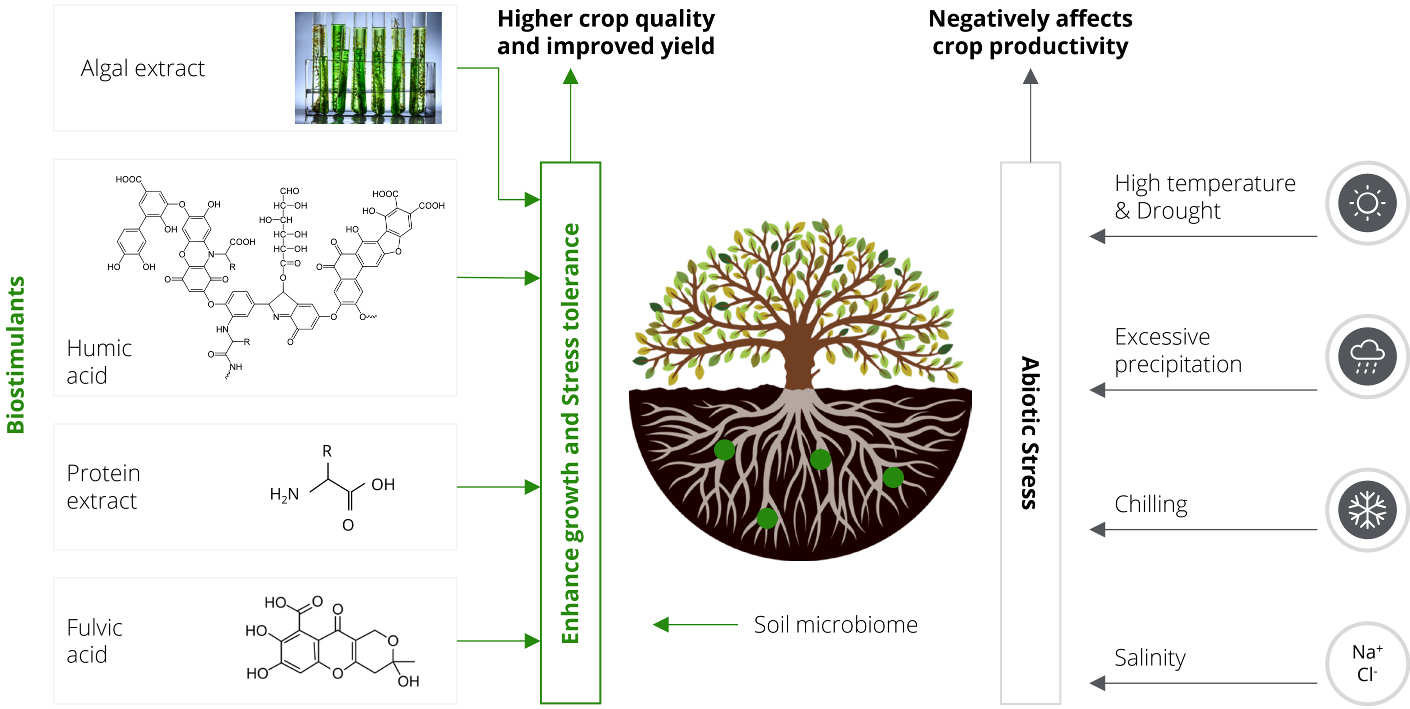
As the challenges to further reduce fertiliser consumption and at the same time increase food production remain, the industry has entered the third act.

Nowadays, the development of agriculture is characterised by technological advancements, particularly the use of artificial intelligence (AI) and digitalisation. AI-powered systems can analyse data from sensors, drones and satellites. These innovations enable pinpoint application of fertilisers based on real-time data regarding soil conditions, weather patterns, and plant needs. The goal is to further maximise efficiency and minimise environmental impact by applying only the exact amount of nutrients required. This phase marks the transition to data-driven agriculture, combining sustainability with productivity.

Alongside the digital transformation in agriculture, biostimulants are a key innovation for the future of sustainable farming. Biostimulants are substances that, when applied to plants or their surrounding environment, activate natural processes to improve plant health and performance. Unlike fertilisers, biostimulants don't directly supply nutrients but work indirectly by stimulating the plant's own physiological processes, such as improving root development or accelerating the production of essential enzymes and hormones. These enhancements lead to increased nutrient uptake, greater tolerance to abiotic stress and improved crop quality. Driven by EU regulations promoting sustainable and eco-friendly practices, Europe is leading in the development of biostimulants. With a global market share of 40% and an annual growth rate of 15%, Europe is reclaiming its leadership in agricultural innovation just as it did in the early days of agrochemistry with the Haber-Bosch process back at the beginning of the 20th century.

Figure 4: Agriculture drones being used to spray fertiliser over a large field.

Figure 5: Diagram showing the influence of biostimulants and physiological effects on plant growth. The diagram is based on works by Pandey *et al.* [12]



Biostimulants are composed of a variety of ingredients, each offering distinct benefits to plant growth and health. Seaweed extracts are rich in natural plant hormones such as cytokinins and auxins, which stimulate root development and help plants manage environmental stress. Protein hydrolysates and amino acids serve as precursors for enzymes and hormones, thereby enhancing metabolic activity. Microbial biostimulants, including Bacillus species and mycorrhizal fungi, improve nutrient availability by fixing atmospheric nitrogen, solubilising phosphorus, and forming beneficial symbiotic relationships with plant roots.

Humic and fulvic acids (Figure 5), complex organic molecules rich in carboxyl (R-COOH) and phenolic groups, improve soil structure and nutrient availability. Humic acids contain a variety of functional groups that dissociate in soil environments, resulting in the formation of both polar and non-polar ends. The hydrophilic polar ends, particularly the anionic groups, are crucial for chelation, as they form stable complexes with cationic metal ions. This process helps immobilise these nutrients in the soil, making them more readily available to plants. By contrast, the non-polar hydrophobic segments repel water molecules, which contributes to improved clay aggregate stability. Additionally, the high cation exchange capacity of humic acids plays a vital role in buffering soil pH and retaining nutrients within the rhizosphere, thereby improving overall soil fertility and plant access to essential elements.[13]

Fulvic acids, on the other hand, are significantly smaller in molecular size and possess lower molecular weight, which allows them to be readily absorbed by plant tissues. Their excellent solubility across a wide pH range makes them highly effective in nutrient transport, especially in foliar applications. Like humic acids, fulvic acids also act as potent chelating agents, binding essential micronutrients such as Fe^{3+}, Zn^{2+}, and Mn^{2+}, and facilitating their uptake into plant cells. Together, humic and fulvic acids complement each other in biostimulant formulations: humic acids primarily enhance soil health and nutrient retention, while fulvic acids improve nutrient mobility and plant absorption

The use of biostimulants has been shown to significantly enhance nutrient use efficiency, increasing it from 83% to 97% in pasture systems. To maintain the same crop yields this improvement allows a 25% reduction in fertiliser inputs, minimising environmental impacts such as nitrous oxide emissions and nitrate leaching.[14] Their effect on yield varies depending on factors like application method, climate, and the type used, but on average, plants treated with biostimulants show a yield increase of up to 18% across all categories.[15]

12) The Role of Biostimulants in Plant Growth, Development, and Abiotic Stress Management: Recent Insights.
13) Frontiers | Understanding the Role of Humic Acids on Crop Performance and Soil Health
14) P. Quille, J. Kacprzyk, S. O'Connell, and C. K. Y. Ng, "Reducing fertiliser inputs: plant biostimulants as an emerging strategy to improve nutrient use efficiency," Discover Sustainability, vol. 6, p. 128, 2025
15) Frontiers | A Meta-Analysis of Biostimulant Yield Effectiveness in Field Trials

Outlook

As the global population continues to grow, so too does the challenge of ensuring food security while addressing pressing environmental concerns. The fertiliser industry stands at the crossroads of this challenge, poised to act as a catalyst for sustainable agricultural transformation. Innovations in chemistry, such as the design of highly specific fertilisers and advanced agrochemical solutions as well as biostimulants, are redefining traditional approaches to food production, enabling higher yields with fewer environmental trade-offs.

The challenge remains significant. Rapid urbanisation, soil degradation, and limited arable land will push the boundaries of what is possible. Additionally, reducing CO_2 emissions during the production of ammonia – a process responsible for nearly 2% of global greenhouse gas emissions – represents another critical challenge that must be addressed to ensure the sustainability of fertiliser manufacturing. However, with breakthrough innovations in chemical formulations, tailored nutrient profiles, and biostimulants, the agricultural sector is uniquely equipped to address these global imperatives.

Europe, as a principal driver of these advancements, is setting global benchmarks through its focus on sustainability and bold regulatory goals, such as those outlined in the European Green Deal. These initiatives are not only pushing the boundaries of scientific innovation but also fostering the development of eco-friendly products that can reduce chemical inputs while maintaining agricultural productivity. This makes European fertiliser products and technologies well recognised and sought after globally.

Meanwhile, significant market growth – projected to reach ~USD 269 billion for fertilisers by the early 2030s – demonstrates the enduring importance of this sector in securing the future of agriculture and offers business and investment opportunities in innovative, fast-growing areas.

For those looking to seize agrochemical-related opportunities in this sector, Deloitte offers specialised advisory services led by industry and subject-matter experts. These services integrate knowledge from the fertiliser and chemical industries, including:

- Strategic advice building on a deep understanding of both the status quo and future prospects, including the market/competitive environment, regulatory framework and technologies

- M&A life cycle services, including identification and assessment of investment opportunities, financial and commercial due diligence, and deal support

- Post-acquisition services supporting business integration, growth perspectives, operational performance and SG&A related topics

Do these sound like services you are looking for? For more information, please contact the agriculture and chemical experts at Deloitte.

Two-speed economy: Flash results of the Deloitte CFO survey

The Autumn 2025 edition of the Deloitte CFO Survey reveals a nuanced picture of the German economy, marked by diverging sectoral dynamics and cautious optimism. While the spring survey showed resilience and investment momentum despite geopolitical tensions, the latest results suggest that the initial optimism has faded – particularly in the manufacturing sector as shown by the answers from 171 CFOs from major German companies who participated in the study.

Mixed business outlooks: services vs manufacturing

Overall, business expectations among German companies have stabilised, with the net index of positive versus negative outlooks rising slightly to +1%. However, this average masks significant sectoral disparities. The manufacturing sector continues to struggle, with a negative index of -3%, driven by pessimism in the pharmaceutical (-11%) and consumer goods industries (-23%). By contrast, the automotive sector is showing signs of recovery, posting a positive index of +27% for the first time in years.

The services sector, especially technology (+33%) and banking (+27%), is buoyed by the AI boom and strong financial markets, lifting the overall sentiment. These sectors are currently the backbone of Germany's modest economic stability.

Investment intentions reflect sectoral divide

Investment plans also reflect the two-speed nature of the economy. While the overall investment index has risen to +12%, this growth is almost entirely driven by the services sector (+28%). Transport and logistics (+56%) and technology (+33%) are leading the charge. By contrast, manufacturing investment is declining, with a sector index of -11%. Machinery (-24%) and consumer goods (-15%) are scaling back, although the pharmaceutical industry stands out with a positive investment outlook (+44%).

Question: Which of the following factors pose a high risk to your company over the next twelve months?

	Autumn 2025
Weaker domestic demand	56%
Geopolitical risks	52%
Increasing regulation in Germany	46%
Rising wage costs	46%
Skilled labour shortage	36%
Weaker foreign demand	36%
Cyber risk	35%
Exchange rate risks	23%
Rising raw material costs	23%
Rising energy costs	21%
Rising capital costs	13%

Employment plans follow a similar pattern: technology firms are hiring (+33%), while manufacturing companies – especially in machinery and automotive – are planning significant workforce reductions (-48%).

Persistent risks and the need for effective reforms

Key risks remain unchanged. Weak domestic demand and geopolitical uncertainties continue to weigh heavily on CFO sentiment, particularly among large and export-oriented firms. The lack of foreign demand is now a central concern for the manufacturing sector, especially machinery. Inflation expectations remain moderate at 2.5%, but concerns about rising labour costs are increasing.

Despite fiscal policy efforts earlier this year, the anticipated economic turnaround has yet to materialise. The manufacturing sector remains under pressure, and declining investment and employment plans suggest that companies do not foresee a near-term recovery.

Germany's economy is currently navigating a two-speed trajectory. While the services sector is expanding and driving short-term optimism, the manufacturing sector continues to face headwinds. To achieve sustainable, broad-based growth, structural reforms must deliver tangible benefits across all sectors – especially those still waiting for a turnaround.

If you want to learn more about the latest economic trends or the study itself, click here: Deloitte CFO Survey Autumn 2025.

Recent multiple developments – cautious M&A activity

Faced with various macroeconomic challenges and shifting market dynamics, global chemical companies struggled with overcapacity and low market demand, geopolitical tensions and high energy costs (Europe) in the first three quarters of 2025. Some companies are thinking about withdrawing their business activities from Europe. In this light, the pressure on margins has intensified and the need for cost optimisation has increased. Strategic evaluations and divestiture initiatives have become key instruments for driving targeted performance improvements.

Increase in trading multiples

Table 1 shows trading multiples, including enterprise value (EV)/EBITDA multiples and price-to-earnings (P/E) ratios, for 27 listed chemical companies across a range of sub-sectors and regions. The multiples are based on the latest financial data and stock prices.

Globally, average EBITDA multiples for chemical companies are slightly higher than in the past mainly due to a number of high EBITDA multiple transactions in Asia. Transactions in Europe stayed at the same multiple levels as in 2024. The average EV/EBITDA multiple for the chemical sector is 12.4x in the first three quarters of 2025, compared to only 11.0x in 2024 but lower than the 13.5x in 2023.

Several interconnected factors are set to shape the path ahead – among them concerns about a potential recession, elevated interest rates, persistent geopolitical tensions, ongoing supply chain challenges, and evolving US trade policies.

The focus will be on particularly attractive, high-growth segments. Companies from the industrial gases sector have the highest valuation multiples with a median of 15.6x EV/EBITDA, followed by consumer chemicals at 15.3x and polymers at 13.8x. Companies operating in the speciality chemicals and diversified sectors have the lowest multiples, with EV/EBITDA valuations of 7.2x and 6.9x, respectively.

Transaction multiples recover

Economic uncertainty across multiple regions has made this a particularly difficult period for M&A activity in the chemical industry, with transaction volumes hitting a notable low in early 2024. However, the market showed signs of recovery in the second half of the year, as deal activity began to pick up again. This trend continued in 2025, although the size of the respective transactions declined. Table 2 provides an overview of transaction multiples in the chemical industry over the past three years.

During the first three quarters of 2025, there was an increase in multiples for strategic acquisitions in the chemicals sector from 8.9x in 2024 to 11.7x in 2025, although numbers have not yet returned to the 2023 levels of 14.4x. The multiples for strategic buyers, 10.8x, have been higher than those for financial investors (7.8x) for the last three years.

Outlook

Overall, we do not expect a sharp increase in M&A activity in the first half of 2026, as issues such as bureaucracy, excessive energy costs, and sluggish market demand are causing market participants to remain cautious. Areas in which we may expect M&A activity from financial buyers include agrochemicals, water treatment, and polyolefins. Strategic acquisitions might also gain momentum, as companies aim to broaden their capabilities and strengthen their portfolios. To enhance both efficiency and growth, the chemical industry is likely to prioritise innovation, sustainability, and efficiency. Furthermore, we anticipate increased consolidation in fields like refineries. and also a sharper focus on specialisation across various segments of the sector.

Table 1: Public Company Valuation Statistics

Company	Country	Share price	Market cap	EV/Revenue					EV/EBITDA					EV/EBIT					P/E				P/BV			
				LTM	2023	2024	2025E	2026E	LTM	2023	2024	2025E	2026E	LTM	2023	2024	2025E	2026E	LTM	2023	2024	2025E	LTM	2023	2024	2025E
		EUR	EURm	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)
Consumer Chemicals																										
Croda International Plc	UK	31.8	4,433	2.6	2.6	2.6	2.7	2.5	12.1	12.3	12.2	11.5	10.3	17.9	17.6	18.2	15.2	13.5	28.2	26.2	18.2	18.6	1.7	1.6	2.0	1.6
Givaudan SA	Switzerland	3,623.1	33,438	4.7	5.1	4.8	4.7	4.6	21.1	26.1	21.7	19.6	18.9	25.0	32.0	25.6	24.4	23.3	37.4	49.9	26.4	27.1	7.6	7.8	6.8	6.4
Novozymes A/S	Denmark	54.0	25,133	6.9	11.7	7.3	6.7	6.3	20.3	37.1	26.0	18.1	16.6	25.2	46.0	33.4	25.7	23.1	23.6	39.8	26.6	27.6	2.3	8.0	0.3	2.2
Symrise AG	Germany	77.2	10,785	2.6	2.7	2.6	2.6	2.5	12.9	16.2	13.2	12.0	11.4	17.2	24.0	18.1	16.7	15.5	25.0	37.5	19.7	20.2	2.9	3.0	2.5	2.4
			Median	**3.7**	**3.9**	**3.7**	**3.7**	**3.6**	**16.6**	**21.1**	**17.5**	**15.1**	**14.0**	**21.5**	**28.0**	**21.9**	**20.6**	**19.3**	**26.6**	**38.7**	**23.0**	**23.6**	**2.6**	**5.4**	**2.2**	**2.3**
			Average	**4.2**	**5.5**	**4.3**	**4.2**	**4.0**	**16.6**	**22.9**	**18.3**	**15.3**	**14.3**	**21.3**	**29.9**	**23.8**	**20.5**	**18.9**	**28.6**	**38.4**	**22.7**	**23.4**	**3.6**	**5.1**	**2.9**	**3.2**
Fertilisers																										
Grupa Azoty S.A.	Poland	4.4	441	1.0	1.0	1.0	1.0	0.9	NM	NM	NM	63.0	8.2	NM	NM	NM	NM	23.3	NM	NM	NM	13.5	0.5	0.3	0.0	0.0
K+S Aktiengesellschaft	Germany	11.9	2,129	0.6	0.6	0.6	0.6	0.6	3.8	3.0	5.4	3.7	3.5	NM	6.3	NM	NM	14.6	NM	11.4	NM	NM	0.5	0.3	0.4	0.4
Yara International ASA	Norway	32.6	8,308	0.9	0.8	0.8	0.9	0.9	7.0	9.5	7.6	5.0	5.4	12.6	26.1	16.5	8.5	9.6	13.4	38.1	9.8	8.7	1.2	1.2	0.1	1.1
			Median	**0.9**	**0.8**	**0.8**	**0.9**	**0.9**	**5.4**	**6.2**	**6.5**	**5.0**	**5.4**	**12.6**	**16.2**	**16.5**	**8.5**	**14.6**	**13.4**	**24.8**	**9.8**	**11.1**	**0.5**	**0.3**	**0.1**	**0.4**
			Average	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**5.4**	**6.2**	**6.5**	**23.9**	**5.7**	**12.6**	**16.2**	**16.5**	**8.5**	**15.8**	**13.4**	**24.8**	**9.8**	**11.1**	**0.7**	**0.6**	**0.2**	**0.5**
Specialty Chemicals																										
Akzo Nobel N.V.	Netherlands	60.1	10,273	1.4	1.4	1.4	1.4	1.4	13.1	11.2	12.2	10.0	9.4	17.4	13.9	15.6	13.4	12.1	27.4	21.4	14.0	14.7	2.5	2.4	2.2	2.2
Arkema S.A.	France	51.3	3,863	0.7	0.7	0.7	0.7	0.7	5.6	4.9	4.8	5.1	4.7	12.2	9.0	9.7	10.6	8.9	13.8	9.4	9.2	10.0	0.6	0.6	0.5	0.5
Clariant AG	Switzerland	7.7	2,531	1.0	0.9	1.0	1.0	1.0	10.9	6.8	7.4	6.0	5.6	23.5	9.7	11.5	9.4	8.5	66.4	11.5	9.1	9.7	1.2	1.2	1.1	1.0
Evonik Industries AG	Germany	14.5	6,762	0.7	0.7	0.7	0.8	0.8	6.6	6.1	6.5	5.9	5.6	13.5	18.1	13.2	12.5	11.4	17.0	27.2	12.8	11.3	0.8	0.8	0.8	0.7
Fuchs SE	Germany	38.5	4,513	1.3	1.3	1.3	1.3	1.2	8.9	9.2	8.8	8.6	7.9	10.7	11.1	10.5	10.6	9.6	18.9	20.5	15.9	16.9	2.8	2.8	2.4	2.4
Johnson Matthey Plc	UK	23.8	3,990	0.4	0.3	0.3	1.2	1.3	8.0	7.0	8.4	7.1	7.6	10.7	9.0	11.5	10.6	11.2	16.9	14.7	13.5	13.7	1.5	1.5	1.8	0.0
LANXESS Aktiengesellschaft	Germany	20.5	1,767	0.6	0.6	0.6	0.7	0.6	7.9	9.2	7.4	7.3	6.6	NA	NM	167.4	NM	59.5	NM	NM	NM	NM	0.4	0.4	0.4	0.4
Sika AG	Switzerland	185.9	29,823	2.9	3.0	2.9	2.9	2.8	15.9	15.8	15.8	15.0	14.1	19.7	19.1	19.6	19.6	18.1	28.3	28.0	21.4	22.4	4.5	4.7	3.9	3.7
Umicore SA	Belgium	17.0	4,082	0.4	0.3	0.4	1.6	1.6	3.6	5.5	NM	7.0	6.9	4.2	7.3	NM	10.7	10.5	5.5	9.3	13.3	14.0	2.0	1.1	1.9	1.9
Wacker Chemie AG	Germany	67.0	3,326	0.8	0.7	0.8	0.8	0.8	7.8	6.7	6.8	7.9	6.7	33.6	15.1	18.9	53.7	24.6	58.7	15.4	64.5	289.4	0.6	0.8	0.7	0.7
			Median	**0.8**	**0.7**	**0.8**	**1.1**	**1.1**	**8.0**	**6.9**	**7.4**	**7.2**	**6.8**	**13.5**	**11.1**	**13.2**	**10.7**	**11.3**	**18.9**	**15.4**	**13.5**	**14.0**	**1.3**	**1.1**	**1.5**	**0.9**
			Average	**1.0**	**1.0**	**1.0**	**1.2**	**1.2**	**8.8**	**8.2**	**8.7**	**8.0**	**7.5**	**16.2**	**12.5**	**30.9**	**16.8**	**17.4**	**28.1**	**17.5**	**19.3**	**44.7**	**1.7**	**1.6**	**1.6**	**1.4**
Polymers																										
Covestro AG	Germany	59.8	11,287	1.0	1.0	1.0	1.1	1.1	27.4	17.6	19.9	17.8	13.2	NM	85.6	212.8	NM	66.4	NM	231.0	NM	NM	1.8	1.7	1.8	1.8
EMS-CHEMIE HOLDING AG	Switzerland	602.4	14,090	6.2	5.7	6.1	6.3	6.1	21.3	23.3	21.6	21.0	20.1	23.1	25.5	23.4	23.0	22.0	38.8	43.1	27.6	28.1	6.3	7.5	7.4	6.9
LyondellBasell Industries N.V.	US	41.2	13,260	0.7	0.6	0.6	0.9	0.9	9.8	5.3	5.9	9.8	8.1	18.0	7.3	8.8	20.0	13.9	22.3	7.6	14.1	18.9	1.3	1.1	1.2	1.4
Victrex plc	UK	7.7	672	2.0	2.0	2.1	2.2	2.1	11.4	5.8	7.9	8.7	7.7	19.4	7.1	10.8	13.9	11.5	23.9	11.5	14.9	16.5	1.3	1.2	1.5	1.3
			Median	**1.5**	**1.5**	**1.5**	**1.6**	**1.6**	**16.3**	**11.7**	**13.9**	**13.8**	**10.6**	**19.4**	**16.4**	**17.1**	**20.0**	**17.9**	**23.9**	**27.3**	**14.9**	**18.9**	**1.6**	**1.4**	**1.7**	**1.6**
			Average	**2.5**	**2.3**	**2.4**	**2.6**	**2.6**	**17.5**	**13.0**	**13.8**	**14.3**	**12.2**	**20.2**	**31.4**	**64.0**	**19.0**	**28.4**	**28.3**	**73.3**	**18.9**	**21.1**	**2.7**	**2.9**	**3.0**	**2.8**
Industrial Gases																										
L'Air Liquide S.A.	France	171.5	98,954	4.0	4.0	4.1	4.1	3.9	14.6	15.8	15.1	13.4	12.4	20.8	23.1	21.6	19.6	17.8	32.1	36.3	24.6	26.2	4.0	4.1	3.5	3.5
Linde plc	UK	396.2	185,790	7.3	6.9	6.4	7.0	6.7	18.6	18.8	16.8	17.8	16.8	26.1	27.4	23.9	23.5	21.9	39.8	43.0	26.7	27.9	5.7	5.3	4.8	5.5
			Median	**5.6**	**5.5**	**5.3**	**5.6**	**5.3**	**16.6**	**17.3**	**15.9**	**15.6**	**14.6**	**23.4**	**25.3**	**22.8**	**21.6**	**19.8**	**36.0**	**39.6**	**25.6**	**27.1**	**4.8**	**4.7**	**4.2**	**4.5**
			Average	**5.6**	**5.5**	**5.3**	**5.6**	**5.3**	**16.6**	**17.3**	**15.9**	**15.6**	**14.6**	**23.4**	**25.3**	**22.8**	**21.6**	**19.8**	**36.0**	**39.6**	**25.6**	**27.1**	**4.8**	**4.7**	**4.2**	**4.5**
Diversified																										
BASF SE	Germany	43.0	38,352	1.0	0.9	1.0	1.0	1.0	10.0	10.1	10.0	8.4	7.8	21.6	22.0	21.8	18.0	16.2	29.7	32.9	17.9	16.0	1.2	1.1	1.1	1.1
Solvay SA	Belgium	26.7	2,785	1.0	0.8	0.9	1.1	1.1	6.5	3.1	5.8	5.3	5.2	9.7	5.8	8.2	8.4	8.0	10.3	5.9	8.5	9.2	2.4	2.2	2.2	2.4
			Median	**1.0**	**0.8**	**0.9**	**1.0**	**1.0**	**8.3**	**6.6**	**7.9**	**6.9**	**6.5**	**15.6**	**13.9**	**15.0**	**13.2**	**12.1**	**20.0**	**19.4**	**13.2**	**12.6**	**1.8**	**1.7**	**1.7**	**1.7**
			Average	**1.0**	**0.8**	**0.9**	**1.0**	**1.0**	**8.3**	**6.6**	**7.9**	**6.9**	**6.5**	**15.6**	**13.9**	**15.0**	**13.2**	**12.1**	**20.0**	**19.4**	**13.2**	**12.6**	**1.8**	**1.7**	**1.7**	**1.7**
Chemical Distribution																										
Brenntag SE	Germany	51.5	7,439	0.6	0.6	0.6	0.7	0.7	9.6	8.0	9.2	7.8	7.3	14.2	9.6	11.8	10.6	10.1	21.2	13.1	13.0	12.8	1.8	1.8	1.6	1.5
IMCD N.V.	Netherlands	91.2	5,385	1.4	1.6	1.5	1.4	1.4	12.7	13.3	12.8	12.1	11.4	15.8	16.0	15.9	15.7	14.5	24.8	21.9	14.8	14.9	2.7	3.0	2.3	2.2
			Median	**1.0**	**1.1**	**1.0**	**1.1**	**1.0**	**11.2**	**10.6**	**11.0**	**10.0**	**9.3**	**15.0**	**12.8**	**13.8**	**13.2**	**12.3**	**23.0**	**17.5**	**13.9**	**13.9**	**2.2**	**2.4**	**1.9**	**1.8**
			Average	**1.0**	**1.1**	**1.0**	**1.1**	**1.0**	**11.2**	**10.6**	**11.0**	**10.0**	**9.3**	**15.0**	**12.8**	**13.8**	**13.2**	**12.3**	**23.0**	**17.5**	**13.9**	**13.9**	**2.2**	**2.4**	**1.9**	**1.8**
Chemical Sector			**Median**	**1.0**	**1.0**	**1.0**	**1.2**	**1.2**	**10.4**	**9.4**	**9.2**	**8.7**	**7.9**	**17.9**	**16.0**	**17.3**	**15.2**	**14.5**	**24.8**	**21.9**	**14.9**	**16.2**	**1.8**	**1.6**	**1.8**	**1.6**
			Average	**2.0**	**2.2**	**2.0**	**2.1**	**2.0**	**11.8**	**11.8**	**11.6**	**12.4**	**9.6**	**17.9**	**19.7**	**31.2**	**17.2**	**18.5**	**27.1**	**32.3**	**19.0**	**28.7**	**2.3**	**2.5**	**2.0**	**2.0**

Sources: S&P Capital IQ, Deloitte analysis; priced as of 9 October 2025

Figure 3: EV/EBITDA, 2025e

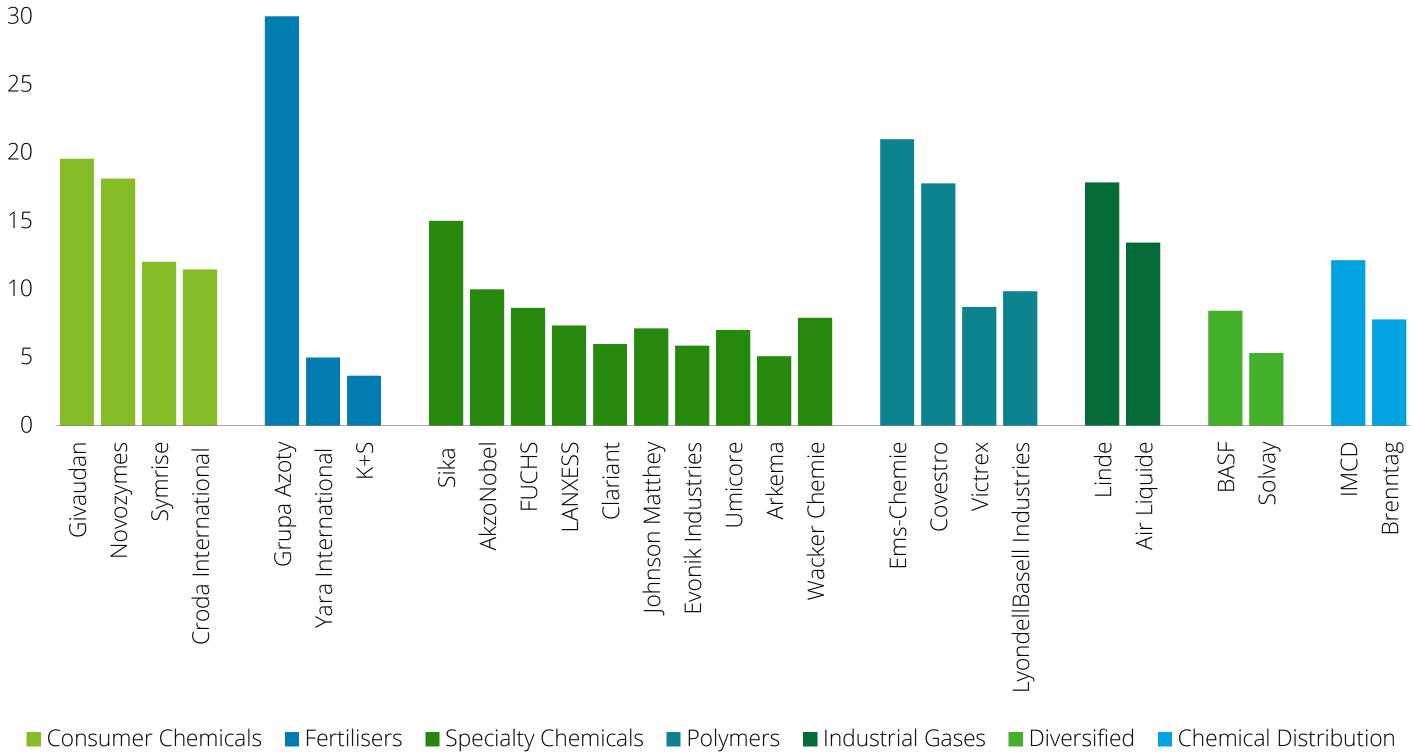
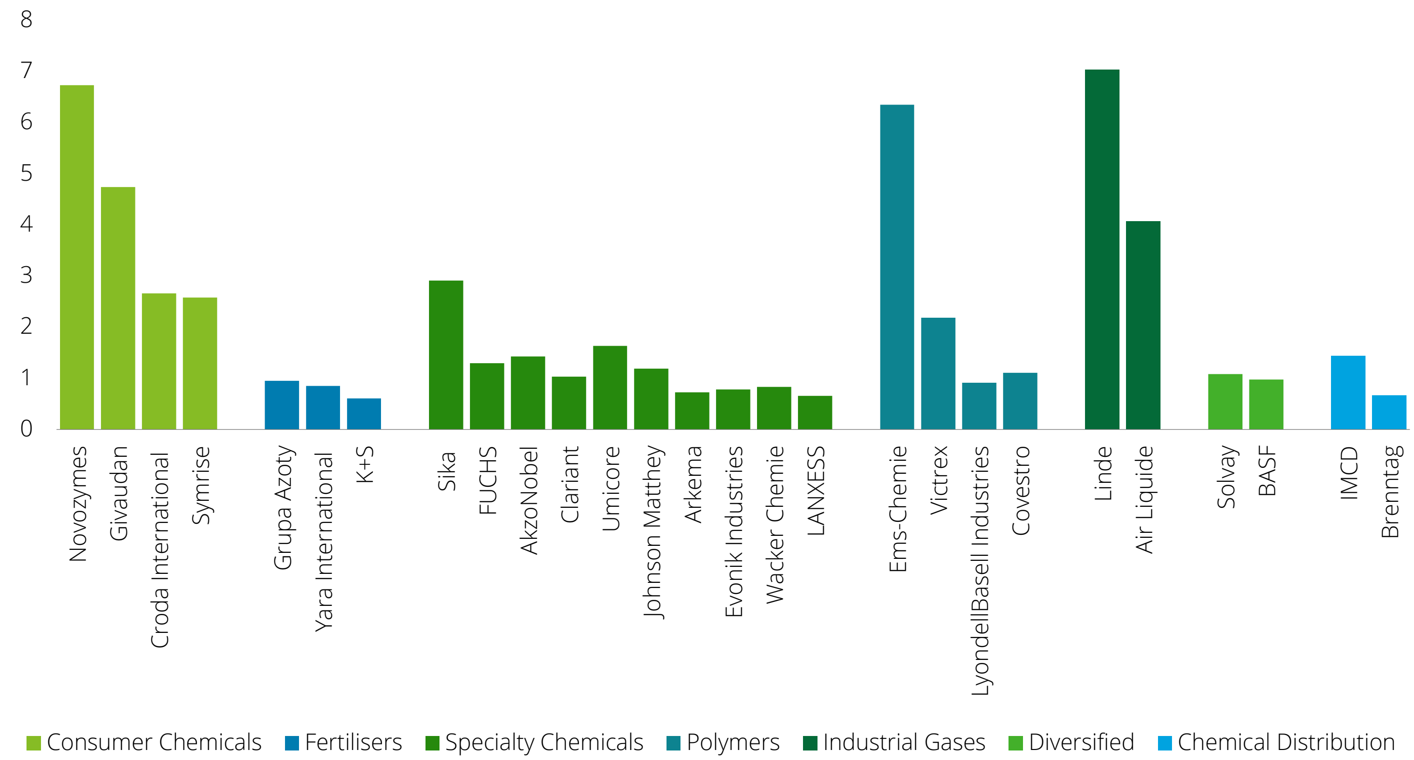


Figure 4: EV/Revenue, 2025e



Sources: S&P Capital IQ, Deloitte analysis

Table 2: Chemicals M&A Activity (Selected Transactions)

Strategic Buyer | 10.8x Median Strategic Buyer | Financial Buyer | 7.8x Median Financial Buyer

	Date	EV ($m)	Target Company	Country	Bidder Company	EV/EBITDA (reported)
2025	Oct-25	9,040	BASF SE (Automotive OEM coatings, automotive refinish coatings, and surface treatment businesses)	Germany	Carlyle Group, along with Qatar Investment Authority	13.0x
	Sep-25	11,803	Brenntag SE (5.8% Stake)	Germany	Artisan Partners Asset Management Inc.	9.3x
	Sep-25	1,200	Profertil (50% Stake)	Argentina	Adecoagro SA; Asociacion de Cooperativas Argentinas C.L.	4.0x
	Sep-25	450	Soft99 Corp (95.2% Stake)	Japan	Effissimo Capital Management Pte Ltd	13.0x
	Aug-25	8	Zuari Agro Chemicals Ltd (Single Super Phosphate (SSP) fertiliser business) (45.97% Stake)	India	Mangalore Chemicals & Fertilizers Ltd	1.7x
	Aug-25	1,837	AlzChem Group AG (9.2% Stake)	Germany	Czechoslovak Group AS; Staluna Trade as	15.0x
	Aug-25	210	Soft99 Corp (68.37% Stake)	Japan	Gyou Asset Management Co Ltd	6.1x
	Jul-25	129	Tekno SA Industria e Comercio (100% Stake)	Brazil	ArcelorMittal SA; Danica Solucoes Termoisolantes Integradas SA	14.3x
	Jun-25	1,793	Akzo Nobel India Ltd (25.24% Stake)	India	JSW Group; JSW Paints Pvt Ltd	23.9x
	Jun-25	1,444	Akzo Nobel India Ltd (74.76% Stake)	India	JSW Group; JSW Paints Pvt Ltd	19.2x
	Jun-25	363	Polisan Holding AS (77.73% Stake)	Turkey	Corex Holding BV	20.3x
	Jun-25	2,104	SK Enmove Co Ltd (30% Stake)	South Korea	SK Innovation Co Ltd	3.2x
	May-25	1,854	Dystar Global Holdings (Singapore) Pte Ltd (37.57% Stake)	Singapore	Zhejiang Longsheng Group Co Ltd; Senda International Capital Ltd	13.4x
	May-25	672	Suzhou Kingswood Education Technology Co Ltd (23.57% Stake)	China	Shiyan Zhongjing Hedao Enterprise Management Partnership LP; Hubei Zhon- gjing Hetai Enterprise Management Co Ltd	21.8x
	May-25	40	William Blythe Ltd (100% Stake)	United Kingdom	H2 Equity Partners BV; Existing Management	7.5x
	Mar-25	154	Dipsol Chemicals Co Ltd (100% Stake)	Japan	Quaker Houghton	10.5x
	Mar-25	2,919	Asia-Potash International Investment (Guangzhou) Co Ltd (5% Stake)	China	Huineng Holding Group Co Ltd	13.0x
	Mar-25	304	Tenma Corporation (66.85% Stake)	Japan	FHL Holdings Co Ltd	26.9x
	Mar-25	24,303	Borouge plc (64% Stake)	United Arab Emirates	Borealis AG; OMV AG	9.9x
	Mar-25	13,400	Nova Chemicals Corp (100% Stake)	Canada	OMV AG; Abu Dhabi National Oil Company PJSC	7.5x
	Mar-25	1,225	Genesis Energy LP (Alkali Business) (100% Stake)	USA	Kew Soda Ltd; We Soda US LLC	2.5x
	Feb-25	89	Lotte Chemical Pakistan Ltd (75.01% Stake)	Pakistan	AsiaPak Investments; Montage Oil	6.5x
	Feb-25	2,165	Sumitomo Bakelite Co., Ltd. (5.91% Stake)	Japan	Sumitomo Bakelite Co., Ltd.	7.9x
	Jan-25	7,550	Zangge Mining Co Ltd (24.82% Stake)	China	Zijin Mining Group Co Ltd; Zijin International Holdings Co Ltd	27.4x

Median: 11.7x
Median: 11.1x

Note: Selected deals with the enterprise value of a target company in excess of USD 500 million

Sources: Mergermarket, Deloitte analysis

Table 2: Chemicals M&A Activity (Selected Transactions)

Strategic Buyer | 10.8x Median Strategic Buyer | Financial Buyer | 7.8x Median Financial Buyer

	Date	EV ($m)	Target Company	Country	Bidder Company	EV/EBITDA (reported)
2024	Dec-24	49,250	Shin Etsu Chemical Co Ltd (1.01% Stake)	Japan	Shin Etsu Chemical Co Ltd	8.2x
	Dec-24	643	Hyosung Chemical Corp (Specialty gas business) (100% Stake)	South Korea	Hyosung TNC Corp	15.9x
	Nov-24	16,468	Hanwha Corp (6.09%)	South Korea	Hanwha Aerospace Co Ltd; Hanwha Energy Corp	5.4x
	Oct-24	4,350	AOC LLC	USA	Nippon Paint Holdings Co Ltd	8.2x
	Oct-24	2,912	Alpek SAB de CV (82.09%)	Mexico	Existing Shareholders	6.0x
	Oct-24	6,624	Arcadium Lithium plc	USA	Rio Tinto Plc	21.1x
	Sep-24	2,292	Sumitomo Bakelite Co., Ltd. (7.02%)	Japan	GIC Pte Ltd	7.5x
	Sep-24	957	Ningbo Changhong Polymer Scientific & Technical Inc. (11.3%)	China	Shenzhen Hanmo Tiancheng Investment Management Co Ltd, etc.	30.5x
	Sep-24	13,054	Qinghai Salt Lake Industry Co Ltd (12.54%)	China	China Salt Lake Industry Group Co Ltd	13.1x
	Aug-24	594	CI Takiron Corp (44.31%)	Japan	Itochu Corp; API LLC	7.2x
	Jul-24	2,252	Asia-Potash International Investment Co Ltd (9.01%)	China	Huineng Holding Group Co Ltd	10.0x
	Jul-24	10,841	Qinghai Salt Lake Industry Co Ltd (5.73%)	China	Sinochem Corp	11.1x
	Jul-24	1,444	Xinjiang Xuefeng Sci-Tech (Group) Co Ltd (21%)	China	Guangdong Hongda Holdings Group	7.8x
	Jun-24	16,685	Covestro AG	Germany	Abu Dhabi National Oil Co	16.3x
	Jun-24	3,416	Lenzing AG (15%)	Austria	Suzano SA	11.2x
	May-24	1,042	Xi'an Manareco New Materials Co., Ltd. (11.74%)	China	Qingdao Development Zone Investment Construction Group	8.2x
	Feb-24	1,580	Saras SpA	Italy	Vitol Holding BV; Vitol Netherlands Cooeperatief UA	2.2x
	Jan-24	2,248	Chambal Fertilisers & Chemicals Ltd (3.74%)	India	Chambal Fertilisers & Chemicals Ltd	8.9x

Median: 11.0x
Median: 8.5x

Note: Selected deals with the enterprise value of a target company in excess of USD 500 million
Sources: Mergermarket, Deloitte analysis

Table 2: Chemicals M&A Activity (Selected Transactions)

Strategic Buyer | 10.8x Median Strategic Buyer | Financial Buyer | 7.8x Median Financial Buyer

Year	Date	EV ($m)	Target Company	Country	Bidder Company	EV/EBITDA (reported)
2023	Dec-23	561	Shanghai Nar Industrial Co., Ltd. (7.07%)	China	Keyuan Holding Group Co Ltd	31.4x
	Dec-23	7,302	Fertiglobe PLC (50%)	UAE	Abu Dhabi National Oil Company for Distribution PJSC	6.3x
	Sep-23	1,015	Ciech SA (22.3%)	Poland	Kulczyk Investments SA	4.3x
	Aug-23	6,214	Clariant AG (1.9%)	Switzerland	40 North Management LLC	7.0x
	Aug-23	1,428	Nanjing Red Sun Co Ltd (23.71%)	China	Goho Asset Management Co Ltd, etc.	9.8x
	Jul-23	1,308	Chase Corp	USA	KKR & Co Inc	13.9x
	Jun-23	6,926	JSR Corp	Japan	JIC Capital Ltd	28.9x
	Jun-23	766	Flex Composite Group SA	France	Compagnie Generale des Etablissements Michelin SA	3.5x
	Jun-23	14,159	Braskem SA (34.37%)	Brazil	Unipar Carbocloro SA	4.5x
	May-23	2,936	RHI Magnesita NV (19.99%)	Austria	Rhone Group LLC	5.7x
	Apr-23	3,014	Vilmorin & Cie SA (28.78%)	France	Groupe Limagrain Holding SA, etc.	21.8x
	Apr-23	1,209	Blackmores Ltd	Australia	Kirin Holdings Company, Ltd.	22.8x
	Apr-23	1,162	Enchem Co., Ltd. (9.36%)	South Korea	JungKang Oh (Private Individual)	33.1x
	Mar-23	54,431	Rongsheng Petro Chemical Co., Ltd. (10.66%)	China	Saudi Arabian Oil Co; Aramco Overseas Company B.V.	12.5x
	Mar-23	8,170	Univar Solutions Inc	USA	Abu Dhabi Investment Authority Ltd-ADIA, etc.	7.8x
	Feb-23	936	Ciech SA (48.86%)	Poland	Kulczyk Investments SA	5.7x
	Feb-23	975	Fuso Chemical Co Ltd. (5.92%)	Japan	Kunpusha Co Ltd	5.7x
	Feb-23	545	Thai Central Chemical pcl (16.55%)	Thailand	Sojitz Corporation; ISTS (Thailand) Co Ltd	14.4x
	Feb-23	10,645	Hengyi Petrochemical Co Ltd (6.4%)	China	Zhejiang Hengyi Group Co Ltd	17.4x

Median: 14.4x | Median: 7.4x

Note: Selected deals with the enterprise value of a target company in excess of USD 500 million

Sources: Mergermarket, Deloitte analysis

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