Unlocking India's specialty chemicals opportunity:

Scale, innovation, and integration of the sector at the global level

May 2026

Foreword by ASSOCHAM

Saurabh Sanyal
Secretary General
ASSOCHAM

I am happy to share that ASSOCHAM is organising the India Speciality Chemicals Conclave 2026, to provide a unique platform for industry leaders, policymakers, technology providers, researchers, and other stakeholders to engage in meaningful discussions on key issues shaping the future of the speciality chemicals sector.

The speciality chemicals sector has emerged as one of India's key sunrise sectors, supporting several downstream industries including pharmaceuticals, agrochemicals, textiles, automotive, electronics, construction, and consumer goods. India has witnessed significant growth in the speciality chemicals sector over the past few years, driven by rising domestic demand, favourable policy initiatives, global supply chain diversification, and increasing investments in manufacturing capabilities.

As India continues to strengthen its industrial and manufacturing capabilities, the speciality chemicals industry is poised to emerge as a key contributor to economic growth, exports, employment generation, and technological advancement. The Government of India's focus on the ease of doing business, infrastructure development, sustainability, and Make in India initiative has further created a conducive environment for the sector's expansion and global competitiveness.

In today's rapidly evolving global landscape, the growing demand for high-performance and environmentally responsible chemical solutions presents significant opportunities for Indian manufacturers to expand globally. In line with these emerging priorities, the conclave will deliberate on innovation and R&D, chemical parks, sustainability, global trade opportunities, emerging technologies, and new-age chemicals.

I am confident that the deliberations and collaborations during this conclave will generate valuable insights and actionable strategies that will further strengthen India's speciality chemicals ecosystem and unlock new avenues for growth, investment, and innovation.

I wish the conclave a grand success.

Message from ASSOCHAM

Sagar Kaushik
Chairman, ASSOCHAM
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& Petrochemicals and President
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The Indian speciality chemicals industry is witnessing strong momentum, driven by changing global manufacturing dynamics, increasing demand for value-added products, and the growing emphasis on sustainable industrial development. Over the years, the sector has evolved into a critical component of India's industrial ecosystem, supporting a broad spectrum of industries such as healthcare, agriculture, infrastructure, mobility, consumer products, and advanced manufacturing.

As global businesses increasingly diversify supply chains and seek reliable manufacturing destinations, India is emerging as a competitive and trusted partner for speciality chemicals production. The country's strong manufacturing base, expanding domestic market, improving infrastructure, and availability of skilled talent have collectively positioned the sector for sustained long-term growth.

At the same time, the industry is witnessing a shift towards innovation-led and environmentally responsible growth models. Areas such as green chemistry, process optimisation, circular economy practices, energy-efficient manufacturing, bio-based solutions, and advanced material technologies are gaining increasing importance across the value chain. These developments are expected to redefine the future trajectory of the speciality chemicals sector and create new opportunities for investment, technology collaboration, and export expansion.

ASSOCHAM is delighted to present this report 'Unlocking India's speciality chemicals opportunity: Scale, innovation, and integration of the sector at the global level'. The report aims to provide valuable insights into the growth potential of the Indian speciality chemicals sector, highlighting key trends, emerging opportunities, and high-growth segments within the industry. It also underscores India's increasing prominence as a preferred global manufacturing destination and its potential to emerge as a significant player in the global speciality chemicals value chain.

We believe that the insights and perspectives presented in this knowledge report will contribute meaningfully to the discussions during the conclave and help foster greater industry dialogue, collaboration, and strategic thinking towards the future growth of the sector.

We wish the event a grand success.

ASSOCHAM Core Committee

Message from PwC

Manas Majumdar
Oil & Gas Sector Leader &
Partner Fuels and Resources,
PwC India

Mukund Devnani
Chemicals & Materials Sector Leader
and Managing Director,
PwC India

As India charts its path to **Viksit Bharat 2047**, the chemicals sector is expected to play a defining role in this journey of industrial reform and economic growth. With deep linkages across agriculture, food and beverages, textiles, rubber, and petroleum refining, the sector already contributes nearly 7% of India's GDP and spans a market of close to 80,000 downstream products—projected to expand from $220 billion in 2024 to $2 trillion by 2047.[1]

Within this broader canvas, the **specialty chemicals** sector is expected to be the most consequential growth domain, with the global market itself expected to expand from approximately from $800 billion in 2025 to nearly $1.05 trillion by 2030.[2]

The global landscape is being reshaped by structural resets—supply chain rebalancing away from concentrated hubs, capital reallocation from commodity to specialty platforms, ESG and regulatory frameworks emerging as non-tariff trade barriers, and geopolitical realignments redrawing sourcing maps. For India, these disruptions present a time-bound but a very real window to move from being a credible contributor to a value-based global leader.

Realising this ambition will require coordinated action across several imperatives—**innovation and operational excellence** through platform-molecule strategies, green chemistry, and AI-led digital transformation; **supply chain and infrastructure** rejuvenation anchored in plastic parks, logistics, and specialty capability development; and a **sustainable finance and markets transition** aligned with global standards, green capital, and circular product portfolios. Equally critical will be multiplying R&D intensity, building scale through consolidation and M&A, and converting India's entrepreneurial and talent depth into proprietary molecules and application-led leadership.

This paper, lays out a strategic framework for the road ahead. We hope you find it informative, insightful, and a useful companion in shaping the next chapter of India's chemicals story.

1 https://www.pwc.in/assets/pdfs/sustainability-dynamic-world-strategic-operational-imperatives-chemicals-industry.pdf
2 PwC analysis, https://www.ibef.org/industry/chemical-industry-india

Contents

01

Unlocking India's specialty chemicals opportunity

1.1 Context

The global specialty chemicals market is entering a new wave of accelerated growth; it is expected to expand from ~$800 billion in 2025 to approximately $1.05 trillion by 2030. In the specialty chemicals sector, the US, China, and Europe have a stronghold on the market and have been the major global exporters for the last 3–4 years.[1]

However, the current situation is being reshaped by disruptive forces, which can alter the sourcing of specialty chemicals. New countries like India, Japan, South Korea, Saudi Arabia are emerging as alternatives; these countries are also increasing their chemical production. These forces are changing the supply from major exporters to regions such as India, Southeast Asia, and the Middle East.

In this context, India's specialty chemicals sector is poised for take-off. Over the past few decades, the industry has shown consistent growth by building operational credibility with global customers and hence has proved itself as a valuable alternative.

1.2 Global shifts reshaping the industry

Supply chain rebalancing: A fundamental shift is happening in the global specialty chemicals industry. The old model, which was built on globalisation, low-cost Asian hubs, and tightly interconnected supply chains, is being quietly dismantled. In its place, a new reality is taking shape, influenced by geopolitical friction, a steady move away from the dependence on major export players, the demands of the energy transition, and a visible redirection of capital from commodity chemicals into specialty segments. The Middle East conflict has brought this transformation into sharper focus. Disruptions around the Strait of Hormuz, which carries nearly a third of the world's oil trade and several critical petrochemical flows, have made geopolitical risk the dominant force behind chemical prices today, rather than classic supply-and-demand dynamics.

Environmental, social, and governance (ESG) and sustainability as competitive differentiators: Sustainability has changed from a compliance requirement to a commercial differentiator. Global customers are increasingly screening suppliers based on emission intensity, waste management, water stewardship, and process safety. Companies in India that have invested in green chemistry, water treatment, and digital process control will thus have a huge winning opportunity of exports in Europe, Australia, and North America.

This shift will have a negative impact on manufacturers who are reliant on legacy and high-emission processes, providing a lucrative prospect for India, given that we invest in sustainability rapidly across the chemical ecosystem.

1 PwC Analysis, https://www.ibef.org/industry/chemical-industry-india

Specialty demand outpacing commodities: Throughout the global market, specialty chemical demand continues to outgrow bulk chemicals, which is supported by structurally strong end markets such as pharmaceuticals, personal care products, food additives, electric vehicles (EVs), and renewable energy applications. It is estimated that specialty chemicals will be one of the highest chemical segments where India can be a net exporter in the coming years.[2]

Capital reallocation towards specialty chemicals platforms: It has been observed that major chemical companies and private equity firms are divesting from commodity businesses to redeploy their capital into higher-margin specialty chemicals. This reallocation is reshaping the industry structure through large-scale mergers and acquisitions and portfolio focus, creating an opportunity for India to build domestic champions.

These global shifts are not disruptions that will pass easily; they are structural resets that demand coordinated strategic responses. For India to grab this opportunity for lasting global relevance, the following imperatives must move together.

2 https://niti.gov.in/sites/default/files/2025-07/NITI-Aayog-Chemical-industry-report.pdf

1.3 Imperatives: What will move the needle?

India currently accounts for approximately $40 billion of the total $800 billion in revenue (FY 2025) and has a considerable talent pool of chemical engineers and scientists, making it an emerging contender. The path from being a contender to a leader will run through five interconnected imperatives. All of these are equally important to chart the roadmap for India to become a leader in the specialty chemicals sector. None of these are sufficient alone—together they constitute an agenda.

01 Invest seriously in R&D and deep science

The specialty chemicals domain, at its core, is an innovation business. India's chemical talent is one of its most underutilised assets. Closing the gap between academic research and industrial applications through various Council of Scientific and Industrial Research (CSIR) industry partnerships, innovation funds, and intellectual property (IP) infrastructure is critical for sectors that aspire to move up in the value chain. The companies that will lead in 2035 need to start investing in their molecule pipelines today.

02 Lead the green chemistry transition

The ESG revolution in the chemical industry is not a distant regulatory risk; it is an immediate reality. European customers have already started embedding sustainability criteria into their procurement processes. This creates an excellent opportunity to get ahead of this curve by investing in green chemistries and credible sustainability credentials rather than trying to scramble to catch up later.

03 Create scale through consolidation and capital

A key challenge is the fragmentation of the sector, and the path to scale will be through both organic investment and industry consolidation, which will create domestic champions of sufficient size to build a global sales network, customisation, and robust research and development. Private equity, strategic mergers and acquisitions, and capital markets will all play a strategic role. and so will relevant policy that shapes incentives that reward significant scale rather than just simple capacity addition.

India's chemical clusters have received around ₹600 crore investment under the new union budget.[3] The country has created integrated chemical clusters like the Dahej PCPIR in Gujarat, Paradeep PCPIR in Odisha, and the Visakhapatnam–Kakinada PCPIR in Andhra Pradesh. However, these regions have not yet grown on par with other prominent international chemical industry centres like China's Caojing industrial complex or the Ludwigshafen cluster in Germany. While the Petroleum, Chemicals, and Petrochemicals Investment Regions (PCPIRs) framework offers a solid policy base for developing India's chemical industry, the practical aspect of implementation and integration is lagging behind what has been achieved in the international chemical industry. Of all Indian clusters, Dahej is currently the most advanced one, followed by other clusters that continue to deal with infrastructure-related reasons.

04 Build a comprehensive export strategy

The need of the hour for the Indian specialty chemical industry is to grow from a single-digit to double-digit global export share by 2035. For that, we would need to look at market development, foster trade relations, and encourage sector-specific export promotion.

India's specialty chemicals market has good potential for growth but the real window is narrowing. It is important to note that the global leadership in chemicals will make sustained and conscious efforts to enhance the scale, research and development (R&D), sustainability, and ecosystem design.

The next decade will be the deciding factor for India. The country has ample potential to become the market leader in specialty chemicals but would need to make bold and coordinated choices aligned with the government, industry, and investors.

The four imperatives outlined above are not isolated levers for growth but are responses to the shift faced by the global specialty chemicals sector which is undergoing an irreversible transition. Factors such as geopolitical friction and sustainability mandates highlight the systemic change in the global landscape, which will further shape the state of the industry over the next decade.

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3 https://static.pib.gov.in/WriteReadData/specificdocs/documents/2026/feb/doc202624779601.pdf

02

Global reset reshaping competitive advantage

2.1. Supply chain fragmentation and China's manufacturing position

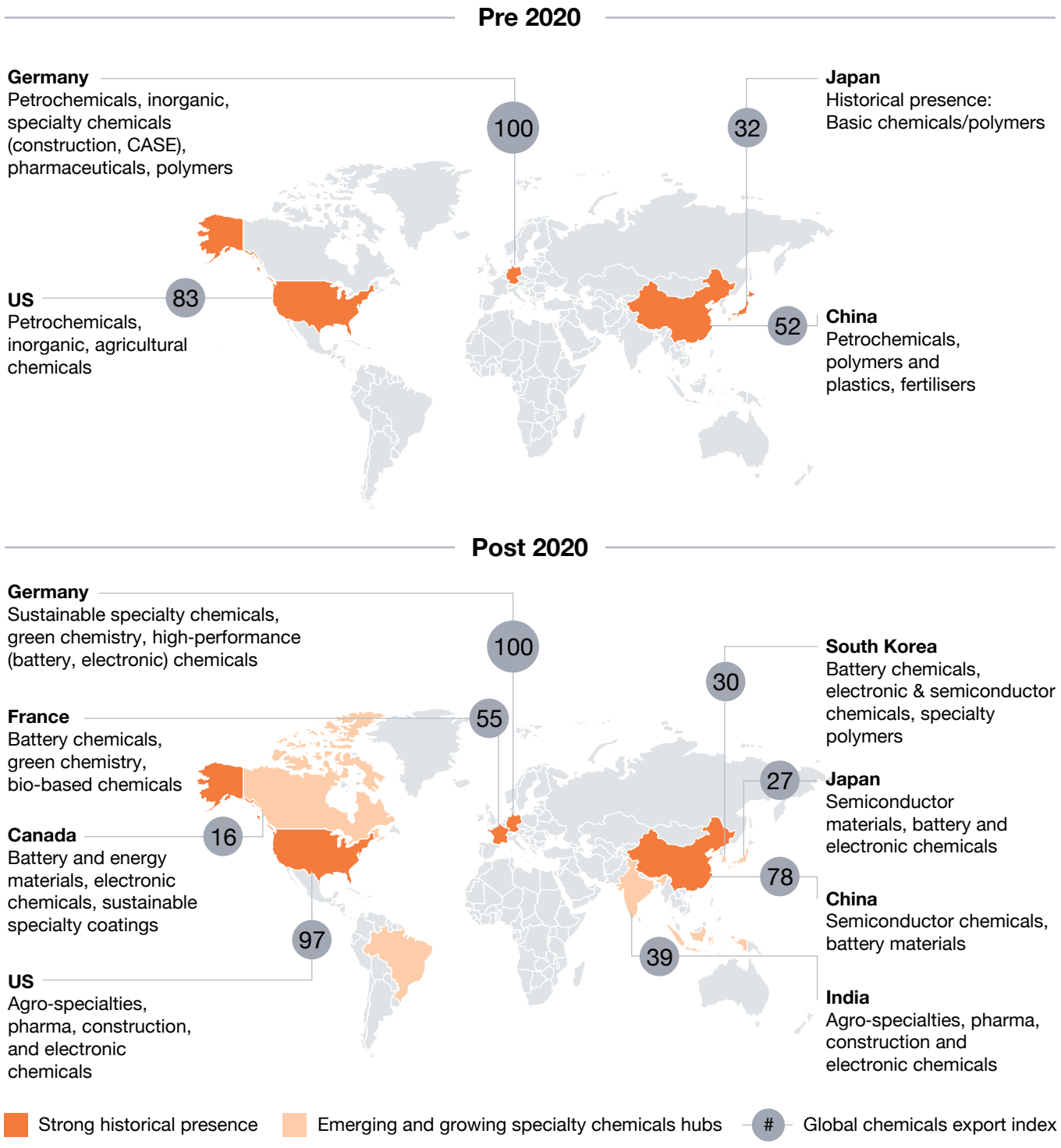
Over the last few decades, the global chemical industry was operating on a clear strategic model where the production was centralised in the US, Europe, and some low-cost Asian hubs. However, in today's scenario of global price volatility, overcapacity, margin pressures, geopolitical disputes, infrastructure maturity, this model is now undergoing a strategic shift towards a more distributed, resilient, and multi-hub supply chain network. As a result, industries are redesigning supply chains to reduce risk and ensure supply chain continuity. A series of events listed below are the major key drivers for this:

- **Geopolitical disruptions and trade realignments:** Geopolitical disputes over the last few years have acted as the primary reason for the supply chain fragmentation.
  - Significant trade tensions between large global economies have disrupted long-established trade flows via tariffs and export controls.
  - Subsequent geopolitical conflicts have further affected energy markets and feedstock availability, particularly impacting certain regions.
  - More recently, strategic economic decoupling and disruptions in key shipping routes due to geopolitical tensions have forced trade route diversions, extended lead times, and increased costs, contributing to regionalisation.
- **China+1 strategy adoption:** China was initially attractive because of its low labour and manufacturing costs, integrated supply chains, and strong domestic markets. But with time, many countries like India, Southeast Asia, and other countries carried out developments to offer these advantages.
- **COVID-19 pandemic-related disruptions:** COVID-19 induced widespread manufacturing shutdowns, port congestion, and logistical bottlenecks, exposing the fragility of lean, efficiency-focused global networks.
- **Regulatory and sustainability divergence:** Stringent, varying environmental, safety regulations demanding the achievement of net zero, decarbonisation targets, traceability of hazardous materials across regions etc., are driving the shift towards greener and sustainable high-performance specialty chemicals.
- **Regional imbalances:** Rising labour costs in traditional manufacturing hubs and energy price volatility, particularly in Europe, have made certain production locations unviable, leading to their relocation. Furthermore, pricing pressures were caused by overcapacity in certain regions.

These events altogether forced the supply chain to focus on security and resilience, favouring sourcing from geopolitical allies. Although this shift comes with various drawbacks like increased costs and higher inventories, it also reduces the risk of supply chain volatility by creating multiple sourcing geographies rather than depending on any one market.

India is emerging as a trusted beneficiary in this diversification. The country has increasing capabilities in areas such as agrochemicals, pharmaceutical intermediates, contract manufacturing, and other specialty chemicals. Furthermore, low labour costs, government support through policies like production linked incentives (PLI), Make in India initiative, proximity to Southeast Asia and the Middle East, and growing domestic consumer market makes India an emerging hub.[4]

Figure 1: Overview of shifting global hubs in specialty chemicals exports[5]



Source: Global trade database; PwC analysis

Note: Global chemicals export index is normalised to Germany (=100) for each period/year and is based on specialty chemical export values.

4 https://niti.gov.in/sites/default/files/2025-07/NITI-Aayog-Chemical-industry-report.pdf

5 PwC analysis, Global Trade Database

Figure 1 shows the transition of global chemical supply chains from one major supply hub to a more fragmented, multi-regional supply. The geography and economics of specialty chemicals are being transformed simultaneously. Before 2020, the industry was effectively dominated by countries such as Germany, the US, and China, with China holding a key position as the volume and cost anchor of the world, along with sustaining its global chemicals production (around 40–45%), integrated value chains, strong infrastructure, and their large domestic demand. This map is being actively contested after 2020, with no single emerging hub replicating China's breadth and instead, each region is carving out distinct arenas for growth.

India shows dominance in agro-specialties and pharma, France, Japan, and South Korea in battery materials, electronics & semiconductor chemicals—all of which are driven by geographical benefits and deliberate policy choices. Critically, China remains strong, but it is being contested, which means India must earn share through genuine capability building rather than simply positioning itself as a default alternative.

2.2. Shift towards high-value specialty segment

The global chemical industry is experiencing a transformation from a volume-based model of commodity chemicals to a value-based model of specialty chemicals. Basic commodity chemicals—including ethylene, propylene, methanol, ammonia, chlorine, and bulk polymers—are made in large quantities and priced based on their cost and production capacity. Specialty chemicals, otherwise known as performance chemicals, are manufactured specifically for their functional properties rather than their chemical composition, allowing manufacturers to earn premium prices and better margins than commodity chemicals.

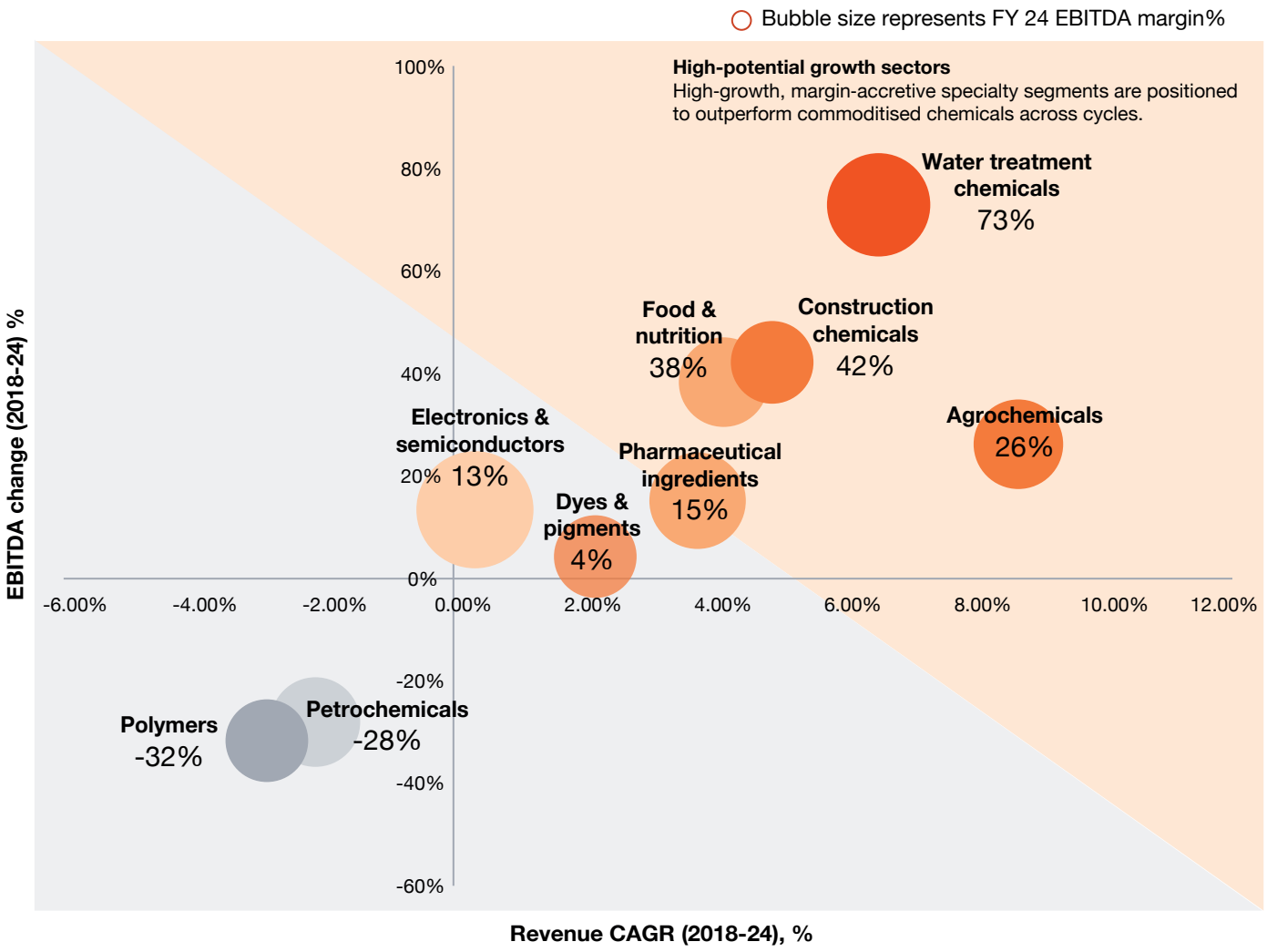
Specialty chemicals constitute ~20% of the global chemical industry by value.[6] Specialty chemical companies generate consistently strong and higher EBITDA margins,[7] backed by formulation knowledge, intellectual property, and high switching costs. Commodity chemicals, on the other hand, earn lower EBITDA margins and are very sensitive to energy prices and market dynamics.

This internal economics of industry is shifting steadily driven by margin pressure in basic chemicals, overcapacity, volatile feedstock prices, weak cyclical demand, and growing demand for customised, high-performance, and regulation-compliant chemical solutions. Commodity segments such as polymers and petrochemicals lag in growth, while high-growth specialty segments including water treatment, construction chemicals, food and nutrition, and agrochemicals are delivering simultaneous revenue growth and margin expansion.

6 https://www.ibef.org/industry/chemical-industry-india#:~:text=Specialty%20chemicals%20account%20for%2020%25,US%24%2064%20billion%20by%202025

7 EBITDA: Earnings Before Interest, Taxes, Depreciation, and Amortization

Figure 2: Global portfolio shift towards high growth, high margin specialty chemicals[8]



Source: PwC analysis

Figure 2 clearly highlights specific segments of the specialty chemicals industry where India has already established its chemistry capabilities—namely agrochemicals, pharmaceutical ingredients, and construction chemicals. These segments are the ones delivering the strongest combination of revenue growth and EBITDA expansion globally.

Commodity-linked segments such as polymers and petrochemicals, where a significant portion of India's current chemical capacity remains concentrated, are contracting in both revenue and margin, signalling that continued capital allocation towards these areas carries increasing opportunity cost.

For Indian specialty chemical players, it is essential that the industry accelerates its portfolio migration towards high-growth, high-margin specialty segments before the window of competitive entry narrows further. India's natural strengths align almost precisely with the segments that are outperforming globally, but it remains significantly under-indexed in actual value capture. The way forward is one of scale and rapid advancement by leveraging inherent strengths and structural opportunities.

8 PwC analysis, company's financial performance news disclosures

2.3. ESG and regulatory frameworks as trade barrier

ESG standards are rapidly transitioning from voluntary disclosures to mandatory requirements for the trade of specialty chemicals, especially in regions like Europe. These standards emerge as non-tariff barriers by increasing compliance, documentation, and verification costs, thus directly impacting customer relationship and market access for specialty chemicals with low volumes and tight timelines. As ESG requirements grow stricter along with existing tariffs and trade measures, competitiveness relies more on how quickly exporters can establish credible ESG compliance systems.

Figure 3: Environmental regulations emerging as key non tariff barrier in chemicals trade

Reach: Market entry barrier

- REACH compliance costs for an individual substance lies in the range of €50k–1,000k per year, based on production volume and data needs
- REACH registration costs increased by 19.5% in 2025 to adjust for inflation.

CBAM: Increased costs due to carbon intensity

- Starting January 2026, EU importers need to purchase CBAM certificates priced at €75.36 per tonne of CO_2 in EU ETS carbon price.
- CBAM initially applies to annual EW imports(~€50 billion) across six sectors, including fertilisers, hydrogen, and chemical intermediates.

European Green Deal and Chemicals Strategy for sustainability (CSS)

- The EU chemicals strategy replaces risk-based control with hazard-based bans, expanding group restrictions like PFAS and creating significant trade impacts by excluding product categories and affecting specialty chemicals.

Persistent organic pollutants (POPs) conventions and international prohibitions on chemicals

- International agreements like the Stockholm Convention on persistent organic pollutants (POPs) set strict bans on certain chemicals, which slows down global trade in those substances.
- By 2025, the convention covered more than 37 chemicals, including additives, intermediates, and other by-products.

Source: European Commission

Social and governance standards: Broadening the trade barrier

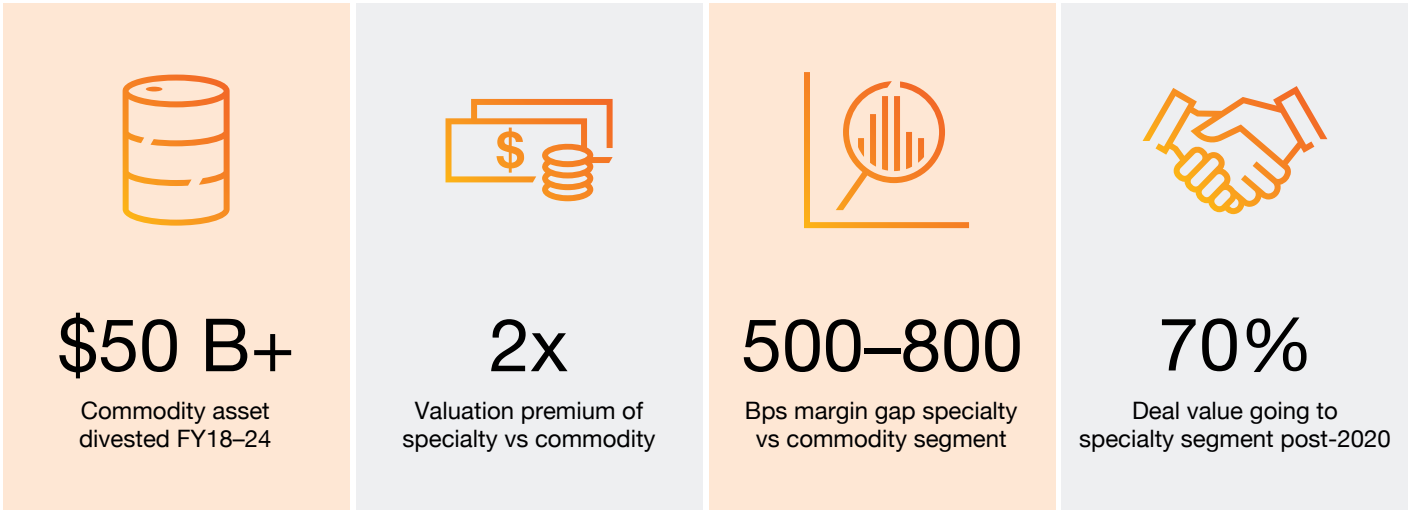
In addition to environmental requirements, specialty chemical exporters are increasingly confronted with social and governance requirements from global buyers and financiers who serve as commercial gatekeepers. Buyers—especially in pharmaceuticals, electronics, agrochemicals, coatings and consumer goods—require labour and safety standards and exclude non-compliant suppliers. The growing demands for ESG disclosure, auditability, and traceability are shifting the competitive advantage from cost and chemistry to institutional maturity, and this presents disproportionate challenges for Indian small and medium-sized enterprises (SMEs) and mid-sized producers.

Disproportionate impact on India's specialty chemicals sector

In India, specialty chemical MSMEs are facing rising cost pressures driven by ESG regulations trade barriers because exporters are obliged to invest in pollution control equipment, audits, detailed documentation, and product level carbon measurement. Mechanisms such as the EU's Carbon Border Adjustment Mechanism (CBAM) require carbon emission and pricing data on exports which further adds to the cost which is harder for smaller firms to absorb.

2.4. Capital reallocation and consolidation trends

Figure 4: Capital reallocation accelerating the specialty chemicals shift



Source: PwC analysis

From diversified conglomerates to focused specialty platforms

Major chemical companies are routinely removing their exposure to diversify from commodity to specialty chemicals. Few examples include:

- BASF, a chemical giant, has sold its kaolin building chemical and pigment operations.
- Clariant, a large player in the industry has sold its pigments, masterbatches, and medical packaging operations so that it can focus on personal care chemicals and catalysts.
- Huntsman has also moved away from commodity intermediates to innovative materials and polyurethanes.

The reasoning behind these shifts is assessed based on free cash flow, return on invested capital (ROIC), and EBITDA margin. The consistent underlying reason is that management teams are assessed based on the above given parameters, where specialty chemicals outperform commodity chemicals.

Mergers and acquisitions (M&A) as a key transformation engine

The most common method is strategic consolidation for transformation of businesses. A leading flavours & fragrances company merged with the nutrition and biosciences division of an American advanced solutions and materials chemical company ($26 billion, 2021) which made them a global leader in flavours, fragrances, and nutrition. A state-owned Dutch multinational conglomerate merged with a renowned Swiss company specialising in fragrances and flavours ($13 billion, 2023) to create the biggest beauty and nutrition platform in the world. A German specialty chemicals company divested its super-absorbents business to a leading global private equity firm. A leading asset management firm purchasing Univar shows the active role of private equity that changes the industry structure. Deal rationales always give priority to proprietary formulation intellectual property, application-based customer stickiness, and pricing power which is shielded from feedstock volatility.

The M&A deals are attracted by 12–18x enterprise value to EBITDA which is twice as high as the 6–8x range for commodity chemicals, which confirms and expedites the reallocation of capital.[9]

Internal discipline and capital allocation

Apart from M&A, internal capital frameworks are being reorganised for capital allocation. Application development and customer co-innovation have increased the spending of R&D on specialty chemicals. Businesses that have EBITDA margins less than 15% are subjected to structural review, sometimes they also are pressured to limit capex and even divest. Growth at any cost has been replaced by disciplined portfolio cuts, with the money going towards shareholder returns and acquisitions in priority segments.

New industry organisation

India is now seeing the sector reorganising into two groups: a growing specialty chemical business and a declining commodity chemical business. The scale of the business is changing, it is now dependent on extent of application expertise, consistency of providing distinguishing value delivery, and depth of customer connections over production numbers. The direction is clear for investors and operators going forward, specialised chemicals are becoming a long-term requirement rather than a one-off play.

9 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2153547&reg=3&lang=2

2.5. India's playbook for success: Move 1— Positioning India as a resilient secondary hub

With China as a major key player in specialty chemicals market, India needs to find its niche to secure its positioning of a reliable secondary hub and establish its presence in the world economy ladder. Robustness of this endeavour may be dependent on several factors including but not limited to the following:

Supply chain management— resilience without cost dilution: Modular brownfield plants near ports and diversified feedstock sourcing via joint ventures will help position India as a trusted secondary hub, reducing import dependence for intermediates and establishing long-term customer-integrated supply agreements. Logistics lead time can be reduced by reinforcing port chemistry clusters at Dahej, Mundra, Vizag, and Paradip with bonded warehousing, faster customs clearance, and hazardous cargo handling. India can offer the global chemical and fertiliser industry a reliable, cost-competitive and agile alternative supply base.

Specialty portfolio focus— utilising India's structural edge: Increasing capital aggregation in agrochemical actives, pharma intermediates, and other specialty chemical segments that deliver consistently higher margins globally, while deprioritising commodity intermediates with high energy intensity and constrained margins.

Capital allocation & M&A strategy—build platforms, not plants: Reposition to application-led R&D from capacity-led capex, with a target of higher R&D intensity compared to India's current ~0.6–0.7%. Utilise M&A to acquire IP, formulations, and customer access at 12–18x EV/EBITDA specialty multiples, versus 6–8x for commodities.[10]

ESG as a competitive capability, not a compliance cost: Establish shared ESG infrastructure for SMEs at the cluster level, invest early in life cycle assessment and digital traceability to meet EU's CBAM requirements effective 2026, and co-invest with anchor customers like BASF and Syngenta. Prevent exclusion from Europe- and US-bound supply chains by professionalising Environment, Health, and Safety (EHS) and governance.

The recent budgetary push is a positive step, but without sustained scale and anchor-led development, India risks underinvesting in its most critical enabler of competitiveness. India's response must be proportionate to that ambition, or it risks this opportunity to Southeast Asian and Middle-Eastern alternatives that are already moving faster. India must decisively move from fragmented, sub-scale industrial estates to a few large-scale, deeply integrated chemical ecosystems that can credibly compete on the global stage. The specialty sector in India must leverage the existing ecosystem of structural strengths and their current position in the global market to produce tangible results.

10 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2153547&reg=3&lang=2

03

India is well positioned, but structurally constrained

3.1. Current scenario of India's specialty chemicals sector

The specialty chemicals sector in India remains one of the most promising markets despite various challenges.

It is characterised by a sharp division between a small segment of organised players and a large base of micro, small, and medium enterprises (MSMEs) operating across segments. Organised Indian specialty players have benefited from a systematic backward integration of raw materials, capital allocation, and growing contract manufacturing partnerships with global innovators in this sector. On the contrary, the unorganised segment operates with lower access to formal credit, minimal investments and limited scale, thus reducing their ability to service global supply chains or meet regulatory standards.

Despite several significant enablers for growth, the gap between policy frameworks and on-ground industrial capability remains significant, creating a tension that defines the present situation of India's specialty chemicals sector.

Figure 5: Role model of a global specialty chemicals leader[11]

Global leader in specialty chemicals

Cost competitiveness

Structural cost leadership through scale, integration, and operational excellence

- World-scale manufacturing drives economies of scale
- Backward-integrated cost base
- Continuous productivity and efficiency improvement programmes

Demand and market access

Broad market access driven by diversified end-market exposure and global reach

- Serving diverse industrial end markets
- Long-term strategic customer partnerships and contracts
- Global sales, technical service, and distribution network

Entrepreneurship and innovation

Differentiated innovation anchored in strong R&D and proprietary know-how

- End-market-focused R&D
- Proprietary formulations and processes
- Rapid lab-to-plant scale-up

Talent and competitiveness

Deep technical capability sustained by a high-performance operating culture

- Experienced chemical leadership
- Strong engineering depth
- Expertise in specialty chemicals formulation and development

Sustainability and EHS

Best-in-class EHS and ESG embedded across the value chain

- Low-carbon and energy-efficient process design
- Transparent and auditable ESG performance metrics
- Proactive regulatory compliance and risk management

Scale and integration

Fully integrated global operations with built-in supply chain resilience

- End-to-end value chains from raw materials to finished products
- Diversified global manufacturing footprint
- Robust and resilient supply network

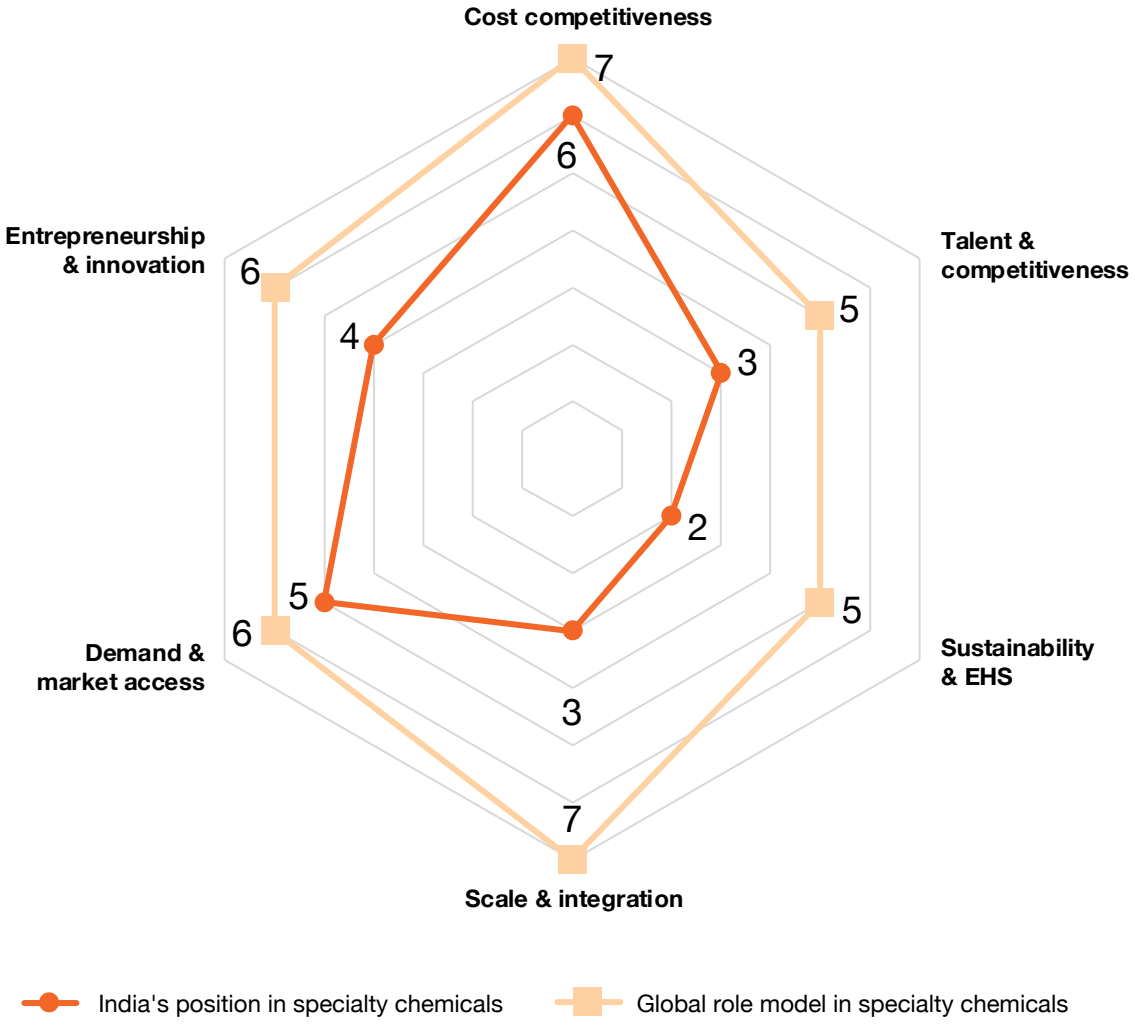
Sources: NITI Aayog; PwC analysis

Figure 5 shows a role model for India, demonstrating the key characteristics of a global leader in specialty chemicals. An ideal player in this segment would focus on cost competitiveness, market demand, and backward integration for their developed world-class manufacturing capabilities. Other factors such as technical know-how, sustainability norms, and R&D investments would also be taken into consideration for overall development, to serve as a global benchmark for India's growth in specialty chemicals.

11 PwC analysis; https://niti.gov.in/sites/default/files/2025-07/NITI-Aayog-Chemical-industry-report.pdf

3.2. The India scenario: Key strengths and structural advantages

Figure 6: India's position in the specialty chemicals sector relative to global benchmarks[12]



Sources: NITI Aayog; PwC analysis

12 PwC analysis; https://niti.gov.in/sites/default/files/2025-07/NITI-Aayog-Chemical-industry-report.pdf

3.2.1 Cost base – Structural advantage for competitive positioning

India's cost structure is one of the most long-standing advantages in the specialty chemicals sector compared to western Europe or North America. This is mainly characterised by significantly low labour costs in the country across all areas of expertise. When compared with European or American benchmarks, the land acquisition and real estate costs in India remain substantially low.

India's cost advantage is not merely an input side phenomenon, but it also translates into tangible commercial leverage which is observed by producers in the agrochemical products sector. These factors enable the producers to make more lucrative deals at lower price points than their competitors, presenting a compelling cost opportunity.

3.2.2. Domestic demand – Ensures stability amidst global volatility

As India is not purely an export-driven economy, it benefits from a large and growing domestic demand base that provides a stable revenue and lowers the impact of global demand cycles. Government support through relevant schemes and capital expenditure across sectors such as roads, water treatment, and energy is responsible for creating multi-year demand for specialty segments such as construction chemicals, water treatment chemicals, and specialty coatings.

This domestic demand acts as a buffer against global price sensitivity and creates a commercialisation pathway for Indian chemical innovators. Products can be developed, tested, and scaled up in the domestic market before pursuing scope for exports which serves as an advantage that reduces the risk for Indian specialty players.

3.2.3. Entrepreneurship and innovation – Catering to local market needs and cost constraints

The entrepreneurial agility shown by the Indian specialty chemical sector differentiates it from the state-directed chemical industries in peer markets across the globe. Several family promoted companies have scaled from narrow product niches to diversifying specialty portfolios through investments or acquisitions to develop the required capability that maintains their relevance in the market. These businesses have long-standing contracts and a legacy network which helps them to retain their market position. The new-age chemical startups have provided the industry with novel ideas and formulations, introducing a new dimension to the Indian specialty chemicals industry.

3.3. Gaps and constraints

Despite several factors strengthening the specialty chemicals sector in India, it is still in a developing stage due to various fundamental constraints that have been slowing down development since decades, as seen in Figures 6 and 7. The constraints can be overcome by investment, innovation and a motive for systemic change in the industry.

Figure 7: India's strengths and structural constraints in the specialty chemicals sector[13,14]

Structural advantages & tailwinds

Cost competitiveness

- **Structurally low labour costs** across all skill levels vs. Europe and East Asia.
- **Low land acquisition** and real estate costs in key clusters.
- **Favourable raw material access** for key specialty inputs including sulfur, phosphorus, fluorine, and chlorine chemistry value chains.

Demand & market access

- Large, growing **domestic market** provides revenue stability amid demand.
- **India's pharmaceutical sector** creates captive, large-scale demand for specialty intermediates and pharma-linked APIs.

Entrepreneurship & innovation

- **Domestic specialty players have scaled because of niche products and diversified specialty** portfolios.
- Indian market has seen a rapid shift from **commodity manufacturing** to integrated partnerships powered by government schemes.
- Growing **contract research** and **formulation technology** services are seen across the agrochemical and pharma-linked API manufacturing segments.

India's gaps & binding constraints

Talent gaps

- R&D investment remains significantly below global benchmarks (**~0.7%** of GDP vs. **2–4%** in global benchmarks) which limit deep innovation capability.
- **Fragmented industry structure** leads to low workforce development and incentives for talent.
- **Limited industry-academia collaboration results in** industry–academia misalignment.

Technology and process gaps

- The industry is largely characterised by reverse engineering and process optimisation.
- **Limited backward integration** among unorganised players increases price sensitivity to global feedstock price swings.
- Most Indian plants are **sized around domestic demand** rather than built to **global-scale benchmarks**.
- **Several single-product** or narrow-portfolio MSMEs operate at a **sub-optimal scale**.

Infrastructure gaps

- The unorganised specialty players have fewer **frameworks for low carbon manufacturing** and sustainability norms.
- A major fraction of the MSMEs in India depend on the **~200+ Common Effluent Treatment Plants**, creating bottlenecks in compliance.

Sources: PIB; PwC analysis

13 PwC analysis; https://www.forbesindia.com/article/budget-2026/indias-expenditure-on-rd-just-0-6-percent-of-gdp-economic-survey/2990842/1

14 https://www.pib.gov.in/FactsheetDetails.aspx?Id=149292

3.3.1 Talent gaps

Insufficient investment in applied research and process chemistry capability is the foundational gap for India's specialty chemicals sector. Even though India produces ~15 lakh engineering graduates annually, the translation of academic knowledge into industrial process capability is weak, due to low industry–academia collaboration and insufficient research funding.[15]

India's gross expenditure on R&D is reported to be at ~0.6–0.7% GDP,[16] which is much lower than the global average. This gap could be bridged by higher corporate R&D investments for developing scientific capability and differentiated process routes. The impact of this gap translates as higher rate of process technology licensing, reverse engineering formulations, or relying on older decades-old chemistry rather than innovative chemistry.

3.3.2 Technology and process gaps

Global players in the specialty chemicals industry are not only focused on new product development but also on co-developing products with customers, solving application-focused problems and embedding end-to-end technical service across products. This requires well-developed technology, field technical service teams, and customer R&D and procurement teams which makes it an intermediate capability gap for the Indian specialty chemical players.

At the advanced level, a major gap faced by a few of the small- and medium-sized players in the industry is lack of investment in technology upscaling and upgradation. Limited adoption of advanced chemical technologies such as green chemistry, catalytic process intensification, and continuous operation technologies constrains both product quality and cost efficiency. The commercialisation gap leads to a scale up gap. Transforming new lab scale processes into reproducible plant scale technologies also requires significant progress and investment, which remains a structural gap.

3.3.3 Inadequate development and infrastructure

The operational costs for chemical manufacturing are greatly affected by physical and organisational gaps such as unreliable utilities, reduced water supply, and low plant capacities which ultimately reduce throughput consistency. The common effluent treatment plants (CETPs) in several clusters operate below the mandated standards which create regulatory issues and, in some cases, periodic plant shutdown and process disruption, as mentioned in Figure 7.

Global competitiveness demands high production volumes to achieve per unit cost efficiencies for continuous operation, which is constrained by limited logistical and technical systems. A well-equipped system for specialty chemicals also requires developed port infrastructure with dedicated chemical terminals, chemical management systems for hazardous chemicals and well enforced safety norms, which is only partially possible for the current state of the Indian specialty chemicals sector.

India's cost advantages through lower land and labour costs are offset due to factors such as logistics and connectivity investments, cold chain availability of specific products, and added costs due to operational inefficiencies.

15 https://timesofindia.indiatimes.com/education/news/pursuing-engineering-once-a-fad-now-a-dilemma-only-10-percent-of-15-lakh-graduates-likely-to-land-jobs-this-year/articleshow/114686084.cms

16 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2141832&reg=3&lang=2

3.4. Import dependence and missed opportunities

High-value specialty chemical import data shows India's structural capability gaps across the value chain. India majorly imports sophisticated specialty products and intermediates that the domestic chemical industry is technically capable of producing but is not scaled up enough to supply. Within the sector, India supplies low-value processing steps for segments such as electronics and semiconductors, high purity specialty solvents, and advanced polymer additives, while importing the high margin upstream products from large global players.

A relevant case in point is that of India's agrochemical industry. The country's existing agrochemical synthesis infrastructure and chemistry talent base could have served as a launchpad for developing generic and off-patent active ingredient molecules to their highest potential—a segment where China and Europe captured dominant global share in the 2000s by making exactly this transition to specialty products. The window for this move, however, is narrowing fast as Chinese and European players are well positioned within the system and are tied up with customers across the globe.

This import dependency presents a structural opportunity cost to the Indian economy as the value in specialty segments such as high-performance polymer modifiers, patented active molecules, and electronic specialty gases, is captured by global suppliers, thus creating a margin gap which needs to be bridged by the Indian specialty chemical players.

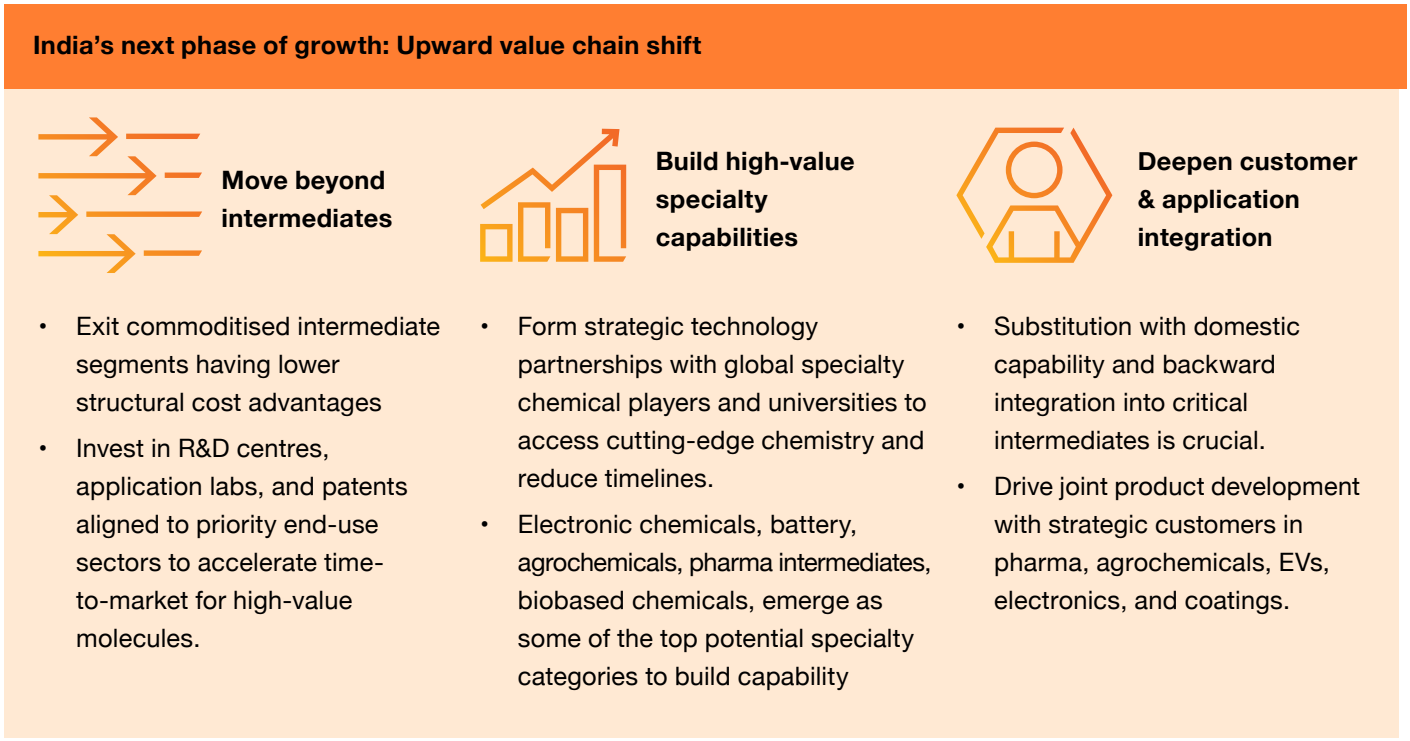
3.5. Key takeaway: Why India has not yet captured disproportionate global share

Several leading specialty chemicals companies in India have grown in the range of 15–20%[17] annually over the past five years, thus delivering strong growth for the sector. However, this performance has not converted into an equivalent share of value creation on the global scale due to a lack of organisational, institutional, or technological investment, which is required in order to compete in segments that generate the highest value.

As a combined effect of a fragmented market scenario, subscale manufacturing, and infrastructure deficit, further burdened by high capital costs and capability gaps, Indian specialty chemical companies face a system-level constraint which is difficult for an individual company to overcome. Indian players require qualitatively different capabilities including deeper R&D investments, regulatory compliant infrastructure, and stronger customer service to scale to their true potential.

17 https://www.livemint.com/industry/indias-share-in-global-specialty-chemicals-market-to-double-in-5-years-crisil-11646296797299.html

Figure 8: India's next growth phase[18]



Sources: Company Financial Disclosures; PwC analysis

3.6 India's playbook for success: Move 2—Aggressively move up the value chain

The strategic imperative which has emerged over the last five years is that India must move towards becoming a value provider of high-performance specialty chemical formulations across the global value chain, with additional capabilities such as proprietary formulations, applications, and regulatory compliance.

This transition requires portfolio migration towards high-purity and high-value products, development of relevant technology, and producing customer-centric as well as globally compliant products with a focus on quality, market relevance, and sustainability standards (Figure 8).

In India, the specialty chemicals market is at an inflection point, possessing a combination of unique strengths such as advantages in cost, domestic demand, and entrepreneurial capabilities alongside structural constraints which can be overcome in the next decade. The path forward is not simply process optimisation and innovation, but that requiring the **4S Framework**: increased focus on **scale, specialisation, sustainability, and strategy** in specialty chemicals having a high-growth potential.

Until now, India's continued reliance on intermediates and low-value segments has limited its ability to capture disproportionate global value. The next phase of growth must be driven by a deliberate shift towards high-margin specialty chemicals, application-driven solutions, and niche segments with high entry barriers. This transition will require not only capital investment but also deeper customer integration and application development capabilities for new-age specialty chemicals.

18 PwC analysis

04

The next growth frontier

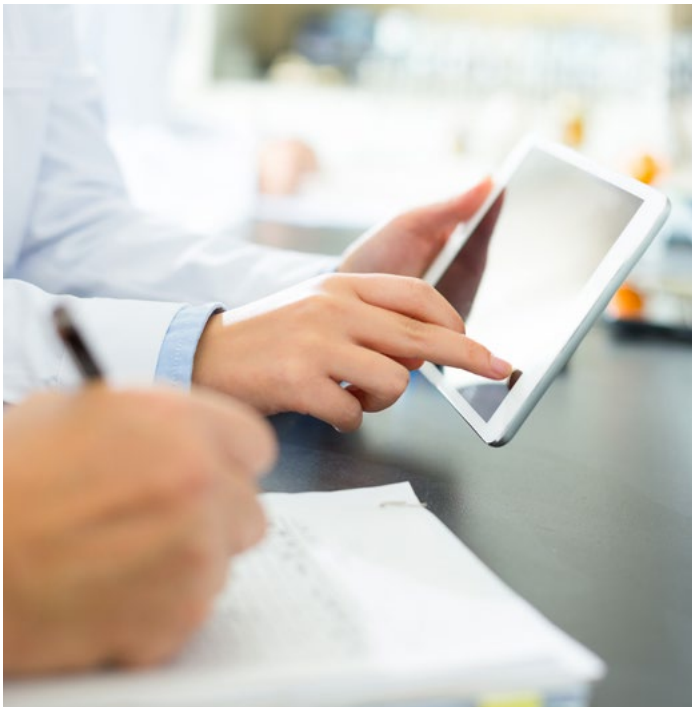
4.1 Strategic changes in operating models

So far, India's historical growth in the chemical industry has been capacity-led and built on an upstream focused growth model. Initially, the focus was on achieving volume-led growth, and thus the north-star metrics were about leveraging scale efficiencies and cost-competitive structures. However, this approach has limitations in terms of capturing value due to intense competition and feedstock dependency. The path ahead for value creation should focus primarily on value-led growth models. This strategic shift will enable us to participate in the high-value, downstream applications where the EBITDA margins are higher owing to differentiated and specialised segments. **Companies need to recognise that the value creation is structurally non-linear across the chemical value chain**.

- **Upstream (feedstocks):** Scale-driven and stable margins
- **Intermediates:** Margin compression zone with limited differentiation, and pricing pressure due to intense competition
- **Downstream:** Higher margins through application-driven chemistries

This transition needs certain shifts in India's operating models, and **leverage some key levers to streamline India's onward shift**.

- **Strong R&D and application development:** This enables us to cater to specific demands of the end user industry catering to niche applications.
- **Technical partnerships and co-development model:** Companies must participate and make strong collaborations in the industry to accelerate the lab scale to commercial scale journey.
- **Tighter compliance and quality control capabilities:** Adherence to stringent industry qualifications requires companies to invest to build capabilities to maintain compliance and global standards.
- **Focused portfolio and capital allocation approach:** Focused demand-centric investments (e.g. high-purity chemicals for semiconductor applications) will enable strong margin potential in the longer run.



Companies that successfully align R&D, portfolio focus, and strategic capital allocation will be able to capture value. Ultimately, this transition requires a strategic shift in how companies design, implement, and scale to unlock the long-term advantage and achieve sustainable margins.

4.2. Macrotrends and shifts: Rise of new-age specialty segments

Demand from emerging applications is reshaped by multiple global trends, policy shifts, and technological interventions. Long-term mega trends like decarbonisation, healthcare expansion, and rapid digitalisation are structurally reshaping the demand across the chemical value chain. These mega trends are the starting point for structural demand growth further in the value chain. These are further supported by capital and policy alignment that are directly affecting Indian markets. This involves Government incentives, global trade agreements, supply chain realignments. Capital reallocation and India-focused investments are further supporting "Why India has a right to win". Additionally, technological revolution and innovation are key growth drivers and pushing the boundaries for advanced manufacturing and further creating demands across these specialty segments (Figure 9).

Figure 9: New-age specialty segments

Source: PwC analysis

Amongst the new-age specialty segments, five of them are gaining strong momentum. This is fuelled by strong investments in these sectors, coupled with policy schemes focusing on manufacturing support. This is accelerating demand and creating long-term market potential for companies. The investments and policies are covered in the table below:

Table 1: Emerging specialty segments - investments and policy schemes

Segment	Key investments	Policy schemes
Battery chemicals	~₹40,000 crore[19] investments by major firms to meet ~45 GWh capacity demand	• ₹18,100 crore[20] Advanced Chemistry Cell (ACC) PLI to develop giga-scale battery manufacturing with strong localisation focus • Union Budget FY26: 35 capital goods[21] exempted from Basic Customs Duty (BCD) to boost domestic Li-ion manufacturing • ₹10,900 crore[22] PM E-Drive (till March 2026) to drive EV demand and component localisation
Electronic chemicals	₹1,59,717 crore[23] semiconductor investments across fabs, assembly, and testing (last three years)	• India Semiconductor Mission (ISM) 1.0 (₹76,000 crore)[24] driving fabs and chemical demand; ISM 2.0[25] to deepen upstream chemical localisation • Electronics Component Manufacturing Scheme (ECMS)[26] - 29 proposals approved by government to boost domestic component manufacturing and reduce import dependence
Pharma-linked intermediates	₹4,709 crore[27] (Bulk drug PLI) + ~₹38,543 crore[28] (Pharma PLI) investments realised by June 2025	• ₹6,940 crore[29] bulk drugs PLI (FY23–29) for APIs/ KSMs • ₹15,000 crore[30] Pharma PLI (FY23–28) for high-value drugs
Agrochemical specialties	Rising investments driven by export growth, capacity expansion, and increasing focus on backward integration and new molecule development	• Champion sector initiative[31] identifies agrochemicals as a priority, supporting growth through R&D incentives, regulatory reforms, and export promotion
Green/bio-based chemicals	Increasing investments driven by bioeconomy expansion, sustainability focus, and growing adoption of bio-based manufacturing technologies	BioE3 Policy (2024)[32] promotes bio-based chemicals and advanced biomanufacturing to enable a sustainable, circular bioeconomy

19 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2104281&reg=3&lang=2
20 https://heavyindustries.gov.in/en/pli-acc
21 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2104281&reg=3&lang=2
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24 https://www.pib.gov.in/FactsheetDetails.aspx?Id=149242&reg=3&lang=1
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31 https://cropcarefed.in/surge-in-agrochemical-imports-alarms-indian-industry-ccfi-demands-higher-import-duty/
32 https://www.pib.gov.in/PressReleasePage.aspx?PRID=2078063&reg=3&lang=2

4.3. R&D intensity-shifting gears: From cost leadership to innovation leadership

India's chemical industry way forward is crucial and approaching a pivotal phase in its growth journey. In the past three decades, companies have built strong positions in the global chemical industry through cost efficiency and process excellence. However, what worked earlier now needs changes to enable us to be ready for what lies ahead. As global demands and trends are reshaping, end-use applications and customer segments are evolving, growth will now be a factor of how you can innovate and not just produce on a scale. The main lever for India to transition from just being a low cost, reliable supplier to become innovation-led product differentiator is revamping our outlook towards R&D. It's imperative to invest more in R&D and build the infrastructure required to develop new customised solutions This transition from a process-driven follower to application-driven innovator isn't easy and needs focused efforts. Else, Indian companies might risk missing out on the most valuable parts of the value chain. However, we need to understand the roadblocks to low R&D intensity across Indian companies

4.3.1 Low R&D intensity

India's R&D intensity is comparatively lower with respect to global benchmarks. There is a considerable gap of ~1–1.5%[33] in the spend on R&D as a percentage of revenue from operations. While there has been progress in the past few years, there is still a significant gap between current scenario and what is needed to match India's economic aspirations and industrial prowess. Structural challenges still reflect in adoption of scientific advancements in the industry. Limited academia–industry collaboration slows the scale-up of research into commercial use, dragging the lab-scale to commercial-scale journey. Limited risk capital and a focus on short-term returns also deter long-term R&D investment, while fragmented infrastructure and skill gaps hinder effective adoption of advanced technologies.

Some factors that affect or limit Indian companies' focus on R&D have been highlighted in:

Figure 10: Reasons for low R&D intensity in India

01 **Historical focus on process over product**
- Indian companies have excelled in cost-efficient manufacturing, prioritising process improvements over new application development, which requires longer timelines and higher risk.

02 **Fragmented industry structure and limited scale**
- The industry is dominated by mid-sized players with constrained balance sheets, limiting the ability to sustain high-capex, long-cycle R&D investments.

03 **Sub-optimal industry–academia coordination**
- Limited linkages between research institutions and industry reduce the conversion of scientific research into commercial applications, delaying innovation cycles.

04 **Limited innovation ecosystem depth**
- Gaps in advanced capabilities infrastructure, specialised talent, and venture funding constrain progress in innovative research.

05 **Risk-averse capital allocation mindset**
- Owing to uncertain payoffs and long gestation periods, companies often prioritise immediate returns over high-risk innovation investments, leading to unprioritised R&D pipelines.

Source: PwC analysis

33 PwC analysis- Company Annual Reports (FY25)

4.3.2. Global benchmarking - Comparative analysis of R&D intensity

Figure 11: Global R&D intensity benchmarking

Process-driven, lower R&D intensity & medium-to-high time-to-market

Parameter	Player	Pharma-linked intermediates
R&D intensity	Global	4%
	India	0.06%
Key differentiators		• **Strong regulatory** track record (USFDA, EMA approvals) • **Advanced chemistry** capabilities (HPAP, multi-step synthesis)

Process + application-driven, low-to-medium R&D intensity, shorter time-to-market

Parameter	Player	Electronic chemicals
R&D intensity	Global	3%
	India	1.05%
Key differentiators		• Strong **proprietary process know-how** • **Deep integration** with semiconductor fabs

Deep science + long cycle innovation, very high R&D intensity & longer time-to-market

Parameter	Player	Battery chemicals	Agrochemical specialty	Green/ Bio-based chemicals
R&D intensity	Global	6%	7%	15%
	India	0.78%	2.90%	1%
Key differentiators		• **Integrated raw material** supply chains • Proven giga-scale **manufacturing consistency** • **Advanced material science** (next-gen chemistries)	• Strong **novel molecule discovery** pipeline • Global **regulatory & registration** capabilities • Branded formulations & farmer engagement strength	• **Proprietary bio-process** technologies • Commercial-scale **cost-competitiveness** • **Strong IP ownership &** partnerships

Factors affecting time-to-market

- Customer qualification cycles
- Regulatory & compliance
- Scale-up & manufacturing difficulty

Factors affecting R&D intensity

- Degree of new vs known chemistry
- Purity & performance requirements
- Process complexity & scalability

10+ years

0-2 years

0 5% 10% 15%

R&D intensity (% of revenue)

Source: PwC analysis

In Figure 11, a comparative analysis has been presented for the R&D intensity between both global and Indian leaders in each segment. One of the factors taken for comparison is **time-to-market**, which reflects the overall commercialisation duration from lab scale to industrial scale. The other factor is **R&D intensity**, which is a percentage of R&D expense of revenue from operations. This figure gives insights into what a global leader—particularly in a specialty segment does in R&D—and how much gap needs to be bridged by an Indian player to capture significant value in each segment. Based on the above figure, these are the remarks commenting on the R&D intensity and time to market for each segment.

1) Electronic chemicals

In electronic chemicals, innovation is largely driven by **process optimisation and application-specific modifications**, rather than new molecule discovery. Rapid semiconductor node advancements create continuous opportunities for new supplier entry in the value chain. Although the purity requirements are highly rigorous, relatively shorter approval processes at semiconductor facilities allow products to reach the market faster than in industries with heavier regulatory constraints.

2) Pharma-linked intermediates

This segment involves high purity chemicals, for which manufacturing requires **complex multi-step synthesis and extremely stringent quality control standards**. Market entry is closely dependent on the **lengthy drug development lifecycle**, involving multiple clinical validation stages and regulatory approvals. Strict regulatory requirements, including Good Manufacturing Practices (GMP) audits and Drug Master File (DMF) submissions, significantly prolong timelines and raise entry barriers.

3) Battery chemicals

Deep material science expertise is one of the core requirements for excelling in this segment, strongly encompassing EV and energy storage applications. Extended testing cycles for safety, durability, and performance stability along with hurdles in **achieving consistency at giga-scale production** significantly slows down commercialisation despite strong long-term demand.

4) Agrochemical specialties

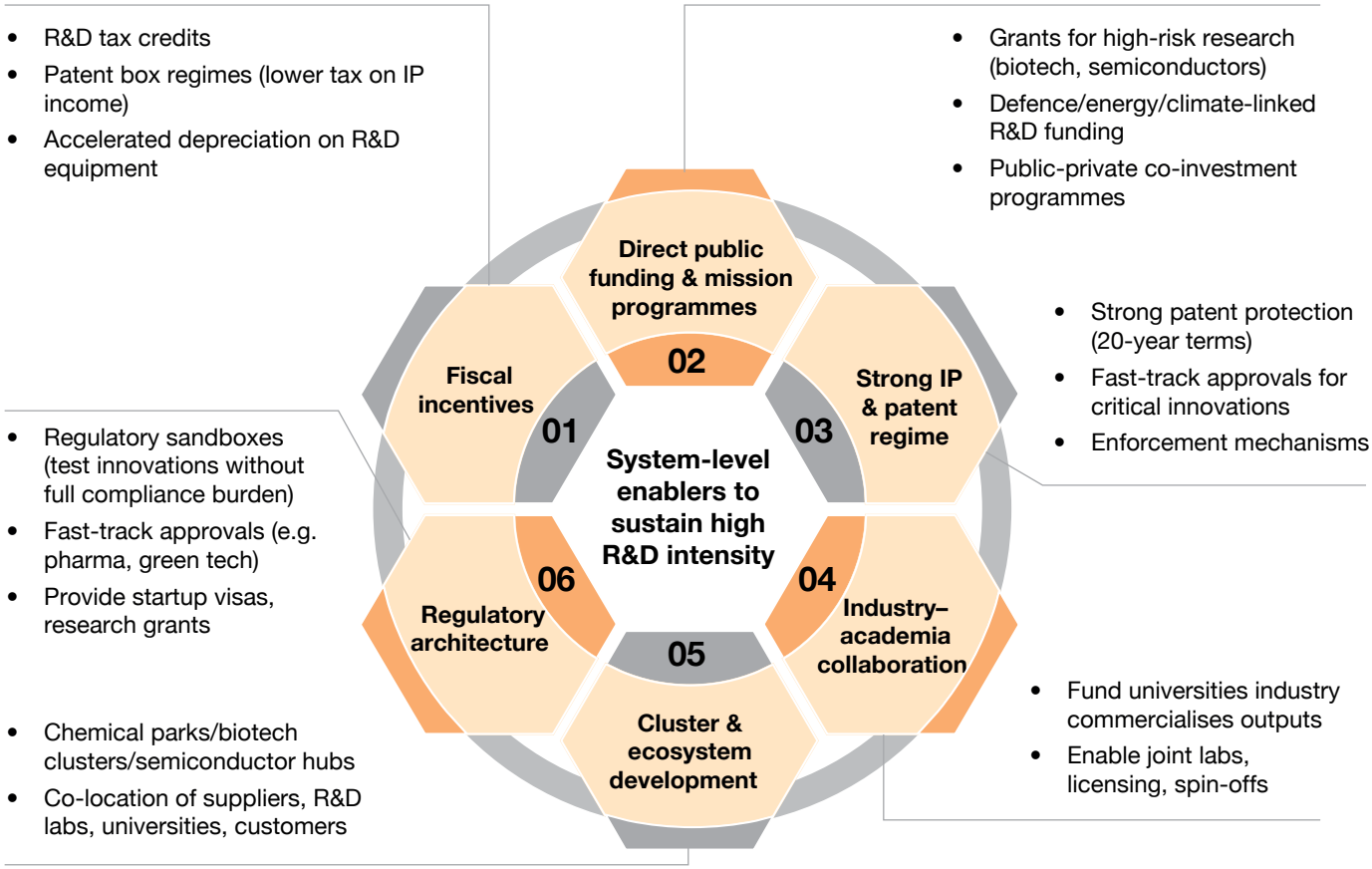
In this segment, the R&D intensity is relatively medium-high range. R&D efforts mainly focus on **improving formulations and refining processes** along with developing completely new molecules, which results in a moderate-to-high level of research intensity. However, time-to-market remains prolonged because products must undergo rigorous regulatory scrutiny, **detailed environmental and toxicity assessments**, and multi-season field trials—all of which are mandatory steps before they can be approved for global markets.

5) Green/bio-based chemicals

Developing sustainable bio routes and alternative feedstocks requires **substantial experimentation** and process refinement to meet **targeted yield and performance levels**, driving up overall R&D intensity. Commercialisation is slowed because bio-based products struggle to reach **cost levels comparable** to **petrochemical routes**, face **difficulties in scaling production reliably**, depend on stable feedstock supply chains, and require time for customers to validate performance and adjust to new pricing structures.

4.3.3. Government–industry–academia: Gaps and policy ecosystem

Figure 12: System-level enablers that allow global leaders to sustain high R&D intensity



Source: PwC analysis

Figure 13: Key system enablers and their impact on R&D intensity (1/2)

Fiscal incentives

Japan offers multiple R&D tax credits (general, open innovation, and high-intensity), allowing companies to claim **2–14%** of research expenses, with total credits capped at ~30% of tax liability.

SMEs receive added support by offsetting R&D credits against local taxes, with extra incentives like a 10% credit for open innovation.

- Directly **increases R&D%** of revenue
- Reduces downside risk of long-gestation innovation

Direct public funding & mission programmes

Japan's total university/public R&D funding rose from **¥266B (FY2022) to ~¥301B (FY2026)**, but **core grants-in-aid funding fell** sharply from ~¥140B to ~¥60B (~43% → ~20% share).

In contrast, **mission-oriented programmes** (multi-year funds + strategic initiatives) grew to ~¥212b in FY2026 (≈70% of total), showing a strong shift towards targeted R&D investments.

- Enables **long-cycle innovation** (5–15 years)
- De-risks **early-stage science** where private **ROI is uncertain**

Strong IP & patent regime

China has **rapidly built a strong IP regime** by becoming the global leader in patent filings—accounting for **~50% of worldwide applications** (≈1.8 million in 2024) and dominating key sectors like **chemistry**.

Alongside scale, it is **strengthening quality** through legal reforms and faster patent systems, signaling a shift from **volume-driven** growth to a more robust, globally competitive **IP framework**

- **Enables companies to invest** multi-million dollars per innovation cycle
- Creates **monopoly-like returns**

Sources: JSPS; C&EN; PwC analysis

Figure 14: Key system-enablers and their impact on R&D intensity (2/2)

Industry–academia collaboration

The US is strong in combining **world-leading R&D ecosystems** (MIT, Stanford, NIH, NSF) with **deep venture capital markets**, enabling rapid commercialisation—seen in sectors like biotech, AI, and semiconductors.

Its model excels at **translating academic research into startups & scalable businesses**, making it one of the most effective systems for converting research into market outcomes.

- Expands **innovation pipeline** without **full cost burden**
- Drives **patent generation** and **talent pipeline**

Cluster & ecosystem development

The EU leverages **regionally specialised clusters** (e.g. Germany's manufacturing, Nordics' clean tech, France's AI hubs) linked through EU programmes, enabling **cross-border collaboration** and **knowledge flow**.

Backed by initiatives like Horizon Europe & smart specialisation, Europe is building **integrated, mission-driven ecosystems** that combine research excellence with industrial scale.

- Faster **time-to-market**
- Higher **cross-pollination** of ideas
- Lower cost of experimentation

Regulatory architecture

Japan's regulatory sandbox lets firms test innovations in real-world settings with **temporary regulatory exemptions**, reducing barriers and accelerating innovation.

By enabling data-driven reforms and smoother commercialisation, it creates a feedback loop linking pilots to policy changes, boosting R&D intensity.

- Reduces **time-to-market** (by years)
- Encourages **experimentation**

Sources: JSPS; https://www.clustercollaboration.eu/sites/default/files/document-store/ECCP_SummaryReport_2025_0.pdf; PwC analysis

India's position in specialty chemicals and advanced materials is increasingly shaped not just by its manufacturing capability, but by the strength of its innovation ecosystem relative to global leaders such as the US, China, and the EU. A comparison across four key parameters—R&D spending, R&D tax incentives, intellectual property ecosystem, and cluster development—highlights that while India has developed strong process chemistry capabilities, it still trails global leaders in institutional support mechanisms that enable sustained deep-science innovation.

Figure 15: Global benchmark: Policy ecosystem for high R&D intensity

	India	United States	China	European Union
R&D spend (% of GDP) 01	~0.7%	~3.4%	~2.4%	~2.2%
R&D tax incentives 02	Moderate (weighted deduction removed recently)	Strong (federal + state credits)	Strong + targeted	Strong (country specific)
IP ecosystem 03	Improving but weak enforcement/ commercialisation	Very strong	Strong (state-backed enforcement)	Strong
Cluster development 04	Emerging (PCPIR, few chemical parks)	Highly mature (Silicon Valley, Boston biotech)	Large-scale industrial clusters	Mature innovation clusters

Sources: Ministry of Science & Technology (India); Association of American Universities; OECD; European Commission; PwC analysis

India's gross expenditure on R&D (GERD) remains significantly below major innovation-led economies. India's R&D expenditure stands at approximately ~0.6% of GDP, compared with ~3.4% for the US, ~2.4% for China, and ~2.2% for the EU.[34] This gap is important because industries such as battery chemicals, bio-based chemicals, and novel agrochemical molecules typically require sustained long-term research investments over multiple years before commercialisation. The higher R&D intensity of the US and China reflects deliberate national prioritisation for advanced manufacturing, semiconductor ecosystems, pharmaceuticals, and next-generation materials. In contrast, India's relatively lower R&D expenditure has historically constrained its ability to build globally competitive innovation-led specialty chemical platforms, despite having a strong chemistry talent base.

The gap becomes more pronounced when examining R&D tax incentives. The Organisation for Economic Cooperation and Development (OECD) data indicates that tax incentives now account for more than half of government support for business R&D expenditure across OECD economies.[35] Countries such as the US, China, and several EU member states have steadily expanded tax-led support mechanisms to encourage industrial research investments. China, in particular, has relied aggressively on super deductions and tax incentives as part of its industrial upgrading strategy, with nearly 85%[36] of total government support for business R&D being delivered through tax incentives. The US complements federal R&D incentives with state-level tax credits and innovation support programmes, while European countries combine tax

34 https://ec.europa.eu/assets/rtd/srip/2024/ec_rtd_srip-report-2024-chap-02.pdf
35 https://www.oecd.org/en/data/insights/statistical-releases/2025/04/rd-tax-incentives-continue-to-outpace-other-forms-of-government-support-for-rd-in-most-countries.html
36 https://www.oecd.org/en/data/insights/statistical-releases/2025/04/rd-tax-incentives-continue-to-outpace-other-forms-of-government-support-for-rd-in-most-countries.html

benefits with direct innovation grants.[37] India, however, has gradually reduced some of its earlier weighted tax deduction benefits for industrial R&D expenditure over the past decade.[38,39] Although India continues to provide certain tax incentives linked to patents and innovation income, the overall policy framework is viewed as less aggressive and less predictable compared with competing innovation economies. This has affected the willingness of Indian companies to undertake high-risk, long-gestation innovation programmes in specialty chemicals and advanced materials.

The intellectual property ecosystem represents another major differentiator between India and global innovation leaders. The US continues to maintain one of the world's strongest IP commercialisation ecosystems, supported by strong patent enforcement, venture capital participation, and academia–industry technology transfer mechanisms.[40] The Bayh-Dole Act in the US played a transformative role in enabling universities to commercialise publicly funded research, which significantly strengthened collaboration between academia and industry. Europe has similarly developed strong institutional IP protection systems and structured research commercialisation mechanisms.[41] China has rapidly strengthened its patent ecosystem over the last decade as part of its strategic push towards technological self-reliance in electronics, batteries, and advanced materials.[42] India has made progress in patent administration and filing volumes, but commercialisation of research remains relatively weak.[43] The country continues to face structural gaps between academic research and industrial deployment, limiting the conversion of scientific research into globally scalable intellectual property. This partly explains why India has developed strong capabilities in generic pharmaceuticals and process chemistry, but remains underrepresented in original molecule discovery, semiconductor materials, and platform biotechnology innovations.

Cluster development has also emerged as a major differentiator in innovative competitiveness. The US benefits from highly integrated innovation ecosystems such as Silicon Valley, the Boston biotechnology corridor, and advanced manufacturing hubs, where universities, startups, venture capital and large corporations operate in close proximity.[44] Europe has similarly built mature industrial innovation clusters across chemicals, advanced materials, and biotechnology.[45] China has aggressively pursued cluster-led industrialisation through state-supported manufacturing parks and industrial ecosystems, particularly in batteries, semiconductors, and specialty materials.[46] This model has enabled rapid scaling, supplier integration, and technology diffusion across the value chain. India has initiated industrial cluster programmes such as PCPIRs and industrial corridors, but the ecosystem remains fragmented and largely manufacturing-oriented rather than innovation-oriented.[47] Most Indian chemical clusters still lack strong co-location between research institutions, pilot-scale facilities, startups, and advanced manufacturing ecosystems. As a result, India has developed significant manufacturing competitiveness in chemicals but not yet achieved the innovation density or ecosystem integration seen in the US, China, or Europe.

Taken together, the benchmarking highlights that leadership in specialty chemicals and advanced materials is driven not only by corporate capabilities, but by coordinated national innovation systems. The US combines deep academia–industry linkages with strong IP commercialisation and venture ecosystems. China couples large-scale state support with industrial clustering and strategic technology prioritisation. Europe leverages structured innovation funding and mature institutional research systems. India, while possessing strong scientific talent and manufacturing capabilities, still lacks the same level of integration between policy, academia, research commercialisation, and industrial innovation. Unless these ecosystem gaps are addressed systematically, India risks remaining concentrated in process-led and cost-led specialty chemical segments rather than emerging as a global leader in innovation-driven specialty materials and deep-science chemical technologies.

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37 https://stip.oecd.org/innotax/
38 PwC analysis
39 https://www.incometaxindia.gov.in/documents/d/guest/en-notified-it-rules-2026-20-03-2026-pdf
40 PwC Analysis
41 https://www.consilium.europa.eu/en/policies/how-the-eu-protects-intellectual-property-rights/
42 PwC Analysis
43 PwC Analysis
44 https://law.duke.edu/sites/default/files/summary_evolving_role_of_universities_0.pdf
45 https://ec.europa.eu/assets/rtd/srip/2024/ec_rtd_srip-report-2024-chap-02.pdf
46 https://www.weforum.org/stories/2026/03/china-industrial-clusters/
47 https://chemicals.gov.in/policies/pcpir-policy-2020-35.pdf

4.4. India's playbook for success: Move 3—Multiplying R&D intensity

In the field of specialty chemicals, India's R&D intensity is much lower when compared to global leaders of specialty chemicals. This disparity indicates underinvestment, capability deficit, and government support. Indian firms have been successful in process development and cost reduction; now it is time for proprietary molecule creation and application-focused chemistry. The closure of the disparity is essential for India to evolve from being a trustworthy supplier to an innovative partner on the global scene.

Scaling R&D intensity will require coordination among entities such as corporates, academia, and policy development authorities. Indian companies must meaningfully raise R&D capital over the upcoming years, treating dedicated innovation as a growth opportunity. The industry–academia connection needs to be further strengthened that can support universities like IITs, Indian Institute of Science (IISc), and CSIR with top quality labs. PCPIRs, being manufacturing-driven, need to move towards innovation-led clusters which will support batteries, electronics, and bio-based chemicals. Financial incentives need to be reformed in terms of re-introduction of weighted tax deduction, patent box approach, and PLIs linked to patents and molecules.

India needs to make an assertive move to gain proprietary products that will allow access to high-margin downstream value chains drive sustainability. This will capture 2–3x value per kilogram through specialty chemicals. The country can then position itself as a co-development partner for global original equipment manufacturers (OEMs) in EVs, semiconductors, and sustainable materials.

If we do not act in time, it may prove disadvantageous for us compared to Southeast Asian countries and the Middle East, as the latter may attract a greater share of global investments. This could limit India's ability to fully leverage the current opportunity window. If missed, Indian players may remain positioned between lower-margin intermediates and pricing pressure, so it is imperative to take urgent action.

05

India's decade of opportunity: From potential to global relevance

5.1 The window is real, but time-bound

At present, India finds itself at an important crossroads that very few countries are in a position to capitalise on. In the past, it was the classical determinants like demand and supply, price, and market risks that played a key role in international business transactions. Now, things are changing. Apart from these factors, geopolitics, changing trade alliances, and tariffs play an important part in shaping the global supply chain network. This provides an opportunity for India to improve its standing in the global economic environment. With global specialty chemicals market projected to expand to approximately $1.05 trillion by 2030, India finds itself distinctly positioned to absorb a significant portion of this future demand.[48] However, opportunities of this nature are inherently time-sensitive. Southeast Asia, Mexico, and select Middle-Eastern hubs are increasingly investing in integrated chemical infrastructure and capabilities. If India does not match their pace, the advantage gap will eventually narrow down. Cost of delay will not be limited to just time but also be in terms of forfeited permanent market share to more agile competitors.

5.2 From key contributor to value-based leadership

India has established itself has a credible contributor in the global specialty chemical industry as the sector has grown in revenue. This position is basis three pillars, one is cost advantage due to competitive labour and economics; second is scale benefits from vibrant domestic demand; and third is an ecosystem that supports entrepreneurship, including family-led enterprises and new-age chemical startups focusing on innovation in different niches.

The next phase of growth will not be defined by incremental capacity additions or by doubling down on intermediates and low-value segments. It will be defined by India's ability to capture higher-value application-led categories, build proprietary formulation capabilities, and deepen integration across the specialty value chain. This shift from volume-led competitive supplier to high-value leadership demands a fundamental reorientation from capacity growth models to an innovation-led, customer-centric model where more focus remains on high EBITDA. This shift will define India's position in the global market as a reliable leader.

Moving ahead, India also needs to prioritise innovation to build an edge in the chemical value chain. The next decade will be a crucial growth phase, and this growth requires a special engine. We've outlined the drivers of this growth engine in the leadership framework below.

48 PwC analysis, https://www.ibef.org/industry/chemical-industry-india

Figure 16: India's next decade growth engine

INNOVATE framework: India's next decade growth engine

I **Infrastructure for innovation**
Development of advanced labs, pilot facilities, and testing ecosystems for smooth commercialisation

N **New policy & regulatory enablement**
Progressive policies, PLI schemes, tax incentives boosting domestic production.

N **New-age talent & skills**
Building a future-ready, multidisciplinary workforce combining core science & digital capabilities

O **Open innovation ecosystems**
Collaboration across academia, startups, global players, and research institutions

V **Value-driven innovation**
Shift from cost arbitrage to high-value, differentiated innovation

A **Application-led development**
End-use and customer-driven approach guiding product development and market alignment

T **Technology adoption**
Tech-driven transformation reshaping processes, productivity, and innovation

E **Export potential & global integration**
Leveraging CRAMS, global R&D collaborations, and strategic partnerships to drive high-value exports

Source: PwC analysis

5.3 Execution at scale will be the differentiator

In India, the policy intent and industry ambitions are mostly aligned, but the main challenge lies in execution at scale which requires coordination and time-bound execution. India has a fragmented market structure, dominated by small- and medium-sized businesses working at optimal scale, which is further compounded by lower R&D intensity of approximately 0.6% of GDP compared to 2.5–5% in innovation-led economies. These structural gaps should be addressed at a larger scale and not at an individual company level. This demands concerted efforts from the government, industry, private equity firms, academic research institutions, and export promotion entities.

The success of this endeavour will depend on India's ability to move decisively and strategically from fragmented, incremental approaches to integrated, scale-driven execution through:

a. creation of a competitive mega chemical cluster
b. scaling the R&D investments to 2x/3x the current intensity
c. enabling credible green chemistry development to rival European sustainability mandates.

Anything less will prevent India from reaching its full potential.

5.4 A defining choice for industry and policymakers

India's specialty chemicals industry is at a strategic crossroads which will change and define the global standing for several upcoming decades. Choices—such as where to concentrate investments, how to build withstanding capabilities, which chemical segments to focus on value migration, and how aggressively India scales consolidation and improves export development—will determine if and how it emerges as a preferred global partner in the specialty chemicals domain.

This opportunity is quite crucial for India. The conditions for growth are in place. Factors such as global reset in supply chain, capital reallocation from commodity to specialty, the shift to for specialty platforms, and the growing ESG-driven procurement preferences in Europe and North America all point towards a crucial window for the country to make bold choices. But opportunity alone won't drive outcomes. India has talent, entrepreneurial depth, policy architecture, and market scale to become a leader in specialty chemicals. What it needs, is for the above factors to be backed by policy support and execution on a scale.

About ASSOCHAM

The Associated Chambers of Commerce & Industry of India (ASSOCHAM) is the country's oldest apex chamber. It brings in actionable insights to strengthen the Indian ecosystem, leveraging its network of more than 4,50,000 members, of which MSMEs represent a large segment. With a strong presence in states, and key cities globally, ASSOCHAM also has more than 400 associations, federations and regional chambers in its fold.

Aligned with the vision of creating a New India, ASSOCHAM works as a conduit between the industry and the Government. The Chamber is an agile and forward looking institution, leading various initiatives to enhance the global competitiveness of the Indian industry, while strengthening the domestic ecosystem.

With more than 100 national and regional sector councils, ASSOCHAM is an impactful representative of the Indian industry. These Councils are led by well-known industry leaders, academicians, economists and independent professionals. The Chamber focuses on aligning critical needs and interests of the industry with the growth aspirations of the nation.

ASSOCHAM is driving four strategic priorities - Sustainability, Empowerment, Entrepreneurship and Digitisation. The Chamber believes that affirmative action in these areas would help drive an inclusive and sustainable socio-economic growth for the country.

ASSOCHAM is working hand in hand with the government, regulators and national and international think tanks to contribute to the policy making process and share vital feedback on implementation of decisions of far-reaching consequences. In line with its focus on being future-ready, the Chamber is building a strong network of knowledge architects. Thus, ASSOCHAM is all set to redefine the dynamics of growth and development in the technology-driven 'Knowledge-Based Economy. The Chamber aims to empower stakeholders in the Indian economy by inculcating knowledge that will be the catalyst of growth in the dynamic global environment.

The Chamber also supports civil society through citizenship programmes, to drive inclusive development. ASSOCHAM's member network leads initiatives in various segments such as empowerment, healthcare, education and skilling, hygiene, affirmative action, road safety, livelihood, life skills, sustainability, to name a few.

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pwc.in

HS/May 2026 - M&C 53104