सत्यमेव जयते

Government of India
Ministry of Chemicals and Fertilizers
Department of Chemicals and Petrochemicals

Catalyzing India's chemicals and petrochemicals: strategies for global integration and growth

October 2024

EY
Shape the future with confidence

INDIA CHEM 2024

FICCI

Foreword

Shri Jagat Prakash Nadda

Hon'ble Union Minister for Health and Family Welfare and Chemicals & Fertilizers

MESSAGE

Shri Jagat Prakash Nadda,
Hon'ble Union Minister for Health and Family Welfare and Chemicals & Fertilizers

India Chem 2024

India has recently become the fifth-largest economy in the world, and is expected to become 3rd largest in few years' time. The Chemical and Petrochemical sector will form an integral part of this growth, considering that there are more than 80,000 essential chemicals that make up the building blocks and raw materials for several downstream industries such as textiles, paper, paints, soap and detergents, pharmaceuticals, agrochemicals, construction and automotives. With the current annual output of Rs. 18 lakh crores, the sector in India is expected to grow at the rate of 10% in the coming years. It will play a critical role in realising our goal of 'Viksit Bharat@ 2047'.

Our Government has undertaken significant reforms to enhance the ease of doing business. Initiatives like 'Make in India' aim to foster growth of domestic manufacturing, attracting investments, and accelerating exports. PM Gati Shakti -National Master Plan is a digital platform which maps the multi-model infrastructure spanning seven engines of growth, that is roads, railways, ports, airports, waterways, mass transport systems, and the logistics infrastructure in the entire country. This shall significantly boost growth and global competitiveness of Indian Industry.

As we aim for a Viksit Bharat by 2047, Chemicals and Petrochemicals sector will be instrumental in our journey. The industry also needs to come up with robust R&D initiatives focusing on sustainable and innovative practices as also development of new technologies and materials. Integration of Circular Economy Principles to ensure sustainability from production to disposal and developing technologies for converting waste plastics and other chemical wastes back into useful chemicals are the need of current times. Indian industry needs to be committed to adoption of sustainable practices, decarbonization and circularity, given our pledge for Net-Zero emissions by 2070.

I complement the Department of Chemicals and Petrochemicals, as also FICCI for organizing India Chem 2024 and Ernst and Young for coming out with this knowledge paper. These efforts will undoubtedly result in informed deliberations towards growth of the chemical and petrochemical sector.

I extend my best wishes for the successful organization of India Chem 2024.

(Jagat Prakash Nadda)

October 16th 2024
New Delhi

Foreword

Anupriya Patel

Minister of State
Health & Family Welfare
and Chemicals & Fertilisers
Government of India

NATIONAL HEALTH MISSION
राष्ट्रीय स्वास्थ्य मिशन

अनुप्रिया पटेल
ANUPRIYA PATEL

सत्यमेव जयते

राज्य मंत्री
स्वास्थ्य एवं परिवार कल्याण
व रसायन एवं उर्वरक
भारत सरकार

MINISTER OF STATE
HEALTH & FAMILY WELFARE
AND CHEMICALS & FERTILISERS
GOVERNMENT OF INDIA

Message

I am glad to see this knowledge report, brought out by Ernst & Young on the occasion of India Chem 2024, being organised by the Department of Chemicals and Petrochemicals in partnership with FICCI. The theme chosen for the 13th edition of India-Chem 2024 is '**Advantage Bharat : Indian Chemical and Petrochemicals paving the way for future**' could not have been more appropriate, as the Indian industry is well placed to not just spearhead Indian economy, but to also strengthen the global supply chains in this critical sector.

India, today is the 6th largest producer of chemicals in the world and 4th largest in Asia. India accounts for about 3% of the world's global chemical sales. India is the 2nd largest manufacturer and exporter of dyes as also the 2nd largest exporter of agrochemicals globally. The share of this sector in the Global Value Addition of the manufacturing sector was 9.5% during FY 2022-23. Indian Chemical industry contributed 7% to the India's total exports value, with a share of Rs. 3.70 lakh crores worth of exports for FY 2023-24.

There are several economic factors that are contributing towards 'Advantage Bharat', such as its expanding middle class, which offers significant market potential. Further, rising incomes in India have fuelled higher demand for various types of consumable products in diverse sectors, such as textiles, automobiles, pharmaceuticals, paints and pigments, soaps and detergents and construction materials, all of which use chemicals. India also has one of the largest skilled manpower in the world with about 1.3 Lakh Startups registered in the country, making it one of the biggest startup ecosystems in the world.

India is well positioned to easily fulfil the basic expectations of an investor with a politically stable governance, a highly competitive labour force and power costs, reduced corporate income tax rates and 100% FDI through automatic route, which has encouraged multinational corporations to establish manufacturing plants, R&D centres and joint ventures in India. India has already attracted an investment of about Rs. 1 lakh crore in the Chemical sector over the last decade.

I am sure that the knowledge report shall significantly contribute to the deliberations at this event. I look forward to the outcome of these discussions, which I am sure will strengthen the Chemical industry, not just in India but, globally as well.

I wish the event a great success!

(Anupriya Patel)

October 14, 2024
New Delhi

कमरा सं. 650, छठा तल, 'ए' विंग, निर्माण भवन, नई दिल्ली-110011, फोन : +91-11-23061998, 23062427
Room No. 650, 6th Floor, 'A' Wing, Nirman Bhawan, New Delhi-110011, Tele : +91-11-23061998, 23062427
E-mail: mosap-mohfw@gov.in

Foreword

Nivedita Shukla Verma

Secretary
Government of India
Ministry of Chemicals &
Fertilizers Department of
Chemicals & Petrochemicals

निवेदिता शुक्ला वर्मा
NIVEDITA SHUKLA VERMA

सत्यमेव जयते

सचिव
भारत सरकार
रसायन और उर्वरक मंत्रालय
रसायन और पेट्रोरसायन विभाग
Secretary
Government of India
Ministry of Chemicals & Fertilizers
Department of Chemicals & Petrochemicals

14th October, 2024

MESSAGE

I'm glad to see that on the occasion of India-Chem 2024, Ernst and Young have come out with this timely knowledge report with the theme of 'Catalysing India's Chemicals and Petro chemicals: Strategies for Global Integration and Growth'.

The theme of the report is in perfect harmony with the theme chosen for the biennial event as it enters its 13th edition, which is "Advantage BHARAT: Indian Chemicals and Petrochemicals paving the future".

The well-developed Indian Chemical sector is evidenced by the fact that it contributes 9.5% of the gross value addition of the manufacturing sector in the country.

The Government has, over the years, taken up several measures to support and promote the industry, such as the implementation of 'Petroleum, Chemical and Petrochemical Investment Regions' in a cluster-based approach with common infrastructure and support services to promote the development of the sector in an integrated and environmentally friendly manner. Our 3 PCPIR regions of Gujarat, Odisha and Andhra Pradesh have attracted a cumulative investment of Rs. 2.43 lakh crore and have generated employment for about 3.7 lakh persons so far, with 824 units getting commissioned.

With the objective of bolstering Research and Develop development efforts in the sector, we have also commissioned 13 Centres of Excellence in the Petrochemical sector and have expanded these by recently adding 5 more Centres of Excellence. The scope of these centres has also been expanded to include research in the chemical sector.

With the growth of this sector, it is extremely important to be sensitive to the needs for safety practices. Department has designed a Disaster Management module for conducting training programs for close to 2400 Major Accident Hazard Units on safe handling of hazardous chemicals at work place and reducing risk associated with them. 48 such safety training programs will be conducted, in industrial clusters across the country over next 5 years. Nearly, 5000 employees will be accordingly trained on chemical safety management as a result.

I hope this paper shall assist the industry in moving forward in a sustainable and environment friendly manner by making full use of technological advancements and building global value supply chains in partnership with international industry corporates.

(Nivedita Shukla Verma)

कक्ष संख्या 501, 'ए' विंग, शास्त्री भवन, डॉ राजेन्द्र प्रसाद रोड़, नई दिल्ली – 110 001
Room No. 501, 'A' Wing, Shastri Bhavan, Dr. Rajendra Prasad Road, New Delhi - 110 001
दूरभाष/Tel.: 011-23384196, 23382467, फैक्स/Fax : 011-23387892, ई–मेल/E-mail : sec.cpc@nic.in
Department Website : www.chemicals.gov.in

Foreword

Deepak C. Mehta,

Chairman, FICCI National Chemical Committee and Chairman & Managing Director, Deepak Nitrite Ltd.

The Chemicals and Petrochemicals (CPC) sector is a cornerstone of India's economic landscape, driving industrial innovation and contributing significantly to job creation and technological advancement. This dynamic industry not only serves as a critical input for various sectors—including agriculture, pharmaceuticals, textiles, and automotive—but also plays a vital role in enhancing the quality of life for millions of citizens. As we move forward, this sector is poised to lead the charge in transforming India into a global manufacturing hub, showcasing our potential on the world stage.

In FY24, the chemicals sector attracted approximately US$844 million in foreign direct investment (FDI). While this represents a decrease from previous years, it highlights the need for renewed focus and strategic initiatives to attract further investment and bolster our industry's global competitiveness. India ranks as the sixth-largest producer of chemicals globally and the third largest in Asia, yet our per capita consumption of chemical products remains at just US$91, compared to over US$1,200 in countries like the US and China. This disparity underscores the significant growth potential our sector possesses.

The CPC industry is currently valued at around US$250 billion and is projected to reach US$300 billion by 2025, growing at a robust CAGR of 9.3%. This growth is fueled by rising domestic demand, increasing exports, and supportive government policies aimed at enhancing ease of doing business and promoting self-reliance. As India emerges as a global manufacturing hub, the CPC industry will be pivotal in driving our ambitions for a Viksit Bharat by 2047.

Government initiatives, such as the Petroleum, CPC Investment Regions (PCPIR) policy and the Production Linked Incentive (PLI) scheme, are crucial for creating an ecosystem that fosters innovation, entrepreneurship, and sustainable practices. These policies aim to unlock latent domestic demand and position India as a competitive player in the global market. The PLI scheme, in particular, is paving the way for robust demand from downstream and emerging sectors, including battery and storage applications, electric vehicles (EVs), solar PV cells, semiconductors, and space technologies.

As we look forward to India Chem 2024, this event will serve as a pivotal platform for stakeholders to discuss strategies, share insights, and collaborate on initiatives that will further propel our sector. I am optimistic about the future of our industry and believe that together we can harness the immense potential that lies ahead. With ongoing investments in technology, sustainability, and infrastructure, we are well-equipped to meet both domestic and international demands.

Foreword

Prabh Das

Chairman, FICCI National Petrochemicals Committee and Managing Director & CEO of HMEL Mittal Energy Ltd.

The CPC industry has long been a cornerstone of India's economic and social development. As our nation continues its upward trajectory, fueled by government initiatives that foster ease of doing business and a focus on self-sufficiency, this sector remains poised to play a pivotal role.

However, the global landscape presents unique challenges. The slowdown in key consumption centers, coupled with excess capacity in certain categories, has created headwinds. The concerning buildup of excess capacity in certain categories risks dampening future investments and undermining the profitability of existing assets. The global focus on environmental sustainability has highlighted waste management deficiencies in many developing nations, raising concerns about potential fallout from international treaties.

Yet, within these challenges lie opportunities. The coming years will define our industry by how effectively we seize these opportunities. The global market will be watching closely to see if China's recent economic stimulus will revive demand, particularly in petrochemicals. Meanwhile, economic disparities between key regions are becoming increasingly pronounced. Amidst this, India emerges as a bright spot, offering a beacon of stability in an otherwise volatile global economy. With inflationary pressures easing, central banks have shifted focus toward stimulating growth, a move that is expected to have a positive ripple effect across our industry.

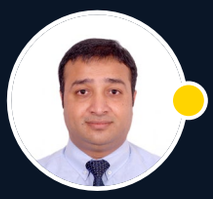
On the policy front, India has implemented progressive regulations to ensure plastics continue to deliver benefits to humanity while fostering a sustainable ecosystem for waste management. A focus on the circular economy is no longer just a regulatory requirement or a response to changing global markets—it is also a source of new opportunities.

In an era where chemical trade carries increasing geopolitical significance, we must envision India not just as self-sufficient but as a global petrochemical hub. At HMEL, we are committed to India's growth story. We made domestic investments in setting up refining capacities of 11.3 Million MT per annum and 467 KT per annum in polypropylene when we started operations. We have recently commissioned a 1.2 million MT per annum cracker complex in Punjab with an additional capacity of manufacturing 1200 KT per annum of polyethylene and 500 KT per annum of polypropylene. We are conscious of our net-zero ambitions and are pursuing several decarbonization projects. We have commissioned a bio-refinery to produce bioethanol for fuel blending. We have also set up renewable energy projects for some of our captive energy requirements and are in advanced stages of discussion for expanding our renewable energy footprint.

Through our Ecosure and Cyclosure brands, we are offering mechanically recycled polymers and chemically recycled polymers to support a more circular supply chain. We are also readying ourselves for further investment in the plastic recycling ecosystem. We believe that these investments will be key drivers of our future growth.

Supply chain security has emerged as a critical global concern. While global supply chains are adaptive and quickly change to adjust to new world realities, the benefits of localizing one's supply chain cannot be understated. In our quest to provide Indian market with the ability to localize the supply chain, HMEL has launched many polymers grades this year and some of these grades are being produced for the first time in the country.

As we look to energize a brighter tomorrow, I am pleased to note the 13th edition of India Chem 2024, is being organized by the Department of Chemicals & Petrochemicals, Ministry of Fertilizers, Government of India, jointly with FICCI. I trust that the insights shared in this knowledge paper will prove valuable for all participants, as we continue to shape the future of our industry.



Foreword

Manoj Mehta

Senior Director & Head - Chemicals & Petrochemicals, FICCI

Manoj Mehta | LinkedIn

The CPC industry is a cornerstone of India's economic landscape, characterized by its knowledge intensity and significant capital investment. This sector is crucial for meeting essential needs and enhancing the quality of life as it encompasses a wide range of products, including basic chemicals, petrochemicals, fertilizers, paints, and pharmaceuticals.

As a vital contributor to the economy, the chemical industry plays a significant role in various downstream sectors, such as textiles, agriculture, healthcare, and infrastructure. It supports the nation's industrial and agricultural development by providing essential building blocks for numerous applications, from everyday consumer goods to specialized industrial products.

In the previous fiscal year (2023-2024, up to December 2023), total production reached 40,508 thousand metric tons, with the petrochemical segment alone producing 31,046 thousand metric tons. This sector not only fuels various downstream industries—such as textiles, pharmaceuticals, and packaging—but also plays a crucial role in emerging sectors like healthcare, automotive, and information technology.

As we explore the report, Catalyzing India's Chemical & Petrochemical: strategies for global integration and growth, we reflect on the immense growth potential and strategic advantages of India's CPC industry. The government's proactive initiatives to improve the Ease of Doing Business (EoDB) are creating a more favorable investment environment, further accelerating growth in this vital sector.

In the coming years, as we embrace innovation and sustainability, the Indian chemical and petrochemical industry is well-positioned to not only meet domestic demands but also compete on a global scale. The commitment to building a self-reliant and resilient economy will drive us toward a future filled with opportunities.

I extend my best wishes for a successful India Chem 2024 and am excited about the prospects that lie ahead for our industry.

Foreword

Aashish Kasad

EY India National Leader - Chemicals and Agriculture sector; India Region Diversity & Inclusiveness Business Sponsor

Aashish Kasad | LinkedIn

In the evolving landscape of the global chemicals industry, the imperative for sustainable growth and the integration of the global value chain is reshaping the sector's future. India, with its vast capabilities and strategic position, is on the cusp of a transformative journey in the CPC sector. This EY report, in partnership with the prestigious India Chem event, meticulously examines the multifaceted aspects of India's CPC industry, offering insights into its trajectory towards global integration and expansion.

With the chosen theme, "Catalyzing India's Chemical & Petrochemical: strategies for global integration and growth," our report endeavors to provide a nuanced perspective on the industry's economic significance, its role within the manufacturing domain, and the strategic initiatives that can propel India to the forefront of the global CPC market.

The Government of India's proactive stance in fostering a conducive environment for the CPC sector is a testament to its commitment to elevating the industry's global standing. Initiatives such as the Petroleum, PCPIR Policy and the PLI scheme are pivotal in catalyzing the industry's expansion and global integration.

Through this report, we navigate the macroeconomic context, manufacturing contributions, and the value chain dynamics of India's CPC sector. We also address the sector's challenges and prospects, drawing parallels with international best practices and underscoring the industry's shift towards sustainable and circular economic models.

At EY, we take pride in contributing to this significant industry dialogue, aligning with our purpose of creating a better working world. By offering expert analysis and strategic foresight, we aim to support stakeholders in making informed decisions that will steer the CPC industry towards a future marked by innovation, sustainability, and robust global participation.

As we unveil this knowledge report, we express our earnest aspirations for the success of India Chem 2024. It is a pivotal moment for India's CPC industry, one that promises growth, opportunities, and a distinguished place on the global stage.

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Executive

India's economic landscape is poised for significant growth, with the nation's status as the largest democracy and an English-speaking population driving its ascent to the third-largest economy globally in the near future. Urbanization and a burgeoning youth demographic are set to fuel demand, while political stability underpins macroeconomic progress. The manufacturing sector, particularly chemicals, has shown resilience post-COVID, with robust growth forecasts and substantial foreign direct investment (FDI) inflows.

The CPC industry in India is on a strong growth trajectory, with market size expansion driven by demand and strategic initiatives to enhance self-sufficiency. Employment in the sector is consistently rising, reflecting the industry's increasing prominence in India's industrial landscape. The government's focus on import substitution and export growth, alongside policy measures like the Production-Linked Incentive (PLI) scheme, is set to bolster the sector further. India's chemical industry, a significant global player, contributes to a wide array of sectors and is expected to reach a market size of US$383 billion by 2030, and double its share of global chemicals industry to 6% by 2030. The industry's growth is underpinned by a diverse range of firms and a strategic emphasis on R&D and innovation. The establishment of Policy Resolution for Promotion of Petroleum, Chemicals and Petrochemical Investment Regions (PCPIRs) and Plastic Parks aims to create world-class infrastructure and attract investment.

The government's initiatives to support plastic recycling and the circular economy, along with regulatory measures promoting sustainability, are reshaping the industry. By benchmarking against global best practices, such as the Circular Economy in the EU and the IRA (Individual Retirement Accounts) in the US, India is positioning itself as a competitive player in the global chemicals market. The Indian CPC sector is shifting toward sustainable practices, focusing on decarbonization and leveraging digital technologies to drive sustainability. Rising demand for specialty chemicals, alongside the push for bioplastics and biodegradables, is accelerating industry growth and creating opportunities for innovation and expansion in both domestic and global markets.

India is emerging as a pivotal manufacturing hub, with the potential to benefit from the China+1 strategy, leveraging its low manufacturing wages and policy reforms aimed at stimulating manufacturing, despite challenges such as higher logistics costs. Foreign institutional investment reflects confidence in India's market, with significant equity inflows since 2019. The chemical and petrochemicals demand in India is driven by domestic demand from linked industries and direct consumers, with substantial growth projected in textiles, automotive, and construction sectors. The specialty chemicals market is expected to register strong growth, driven by increased investments and infrastructure development.

summary

India's Contract Research and Manufacturing Services (CRAMS) sector is expanding, with Indian chemical firms establishing themselves as key players in this market due to their synthetic capabilities, cost efficiency, and intellectual property safeguards. The CRAMS market in India is expected to grow significantly, with a strong focus on pharmaceuticals and agrochemicals.

As China's competitive advantage in the global specialty chemicals industry weakens due to rising labor costs and stricter environmental regulations, India stands to gain from this shift. India's cost advantage and incentivized government policies present a significant opportunity for specialty chemical players to capture a larger market share. India's demographic advantage, with a young and rising labor force and low manufacturing labor costs, position it favorably for deeper Global Value Chain (GVC) integration. Supportive policy reforms in labor and land acquisition, along with schemes like PLI and Remission of Duties or Taxes on Export Products (RoDTEP), further enhance India's attractiveness for manufacturing investments.

The Indian chemical sector is uniquely positioned for sustainability, with a commitment to green technology and net zero emissions by 2070. The industry is transitioning to sustainable production methods and integrating green chemicals to meet the rising demand for eco-friendly products. However, the Indian chemical industry faces challenges for deeper GVC integration, including raw material import dependence, high logistics costs, and competition from global players. Through higher investments in R&D and harnessing the skilled talent pool available in India, the industry could transform itself into a "Chemical and Petrochemical innovation hub for the world".

A strategic roadmap emphasizes the role of technology and R&D in increasing GVC integration, with advanced technologies transforming production processes and enabling real-time monitoring. Collaborative R&D efforts and strategic partnerships, such as potential FTAs with the US and EU, are crucial for enhancing regulatory alignment and market access. Attracting investments in the sector is a priority, with the government adopting a liberal approach to FDI and proposing a PLI scheme to boost domestic manufacturing capacity.

Focus on bioplastics and end-of-life cycle solutions, along with the implementation of the PLI scheme for Chemicals and the Advanced Chemistry Cell (ACC) ecosystem, are key strategies for industry growth. To address the challenges faced by Petroleum, Chemicals, and Petrochemicals Investment Regions (PCPIRs), India must streamline regulatory processes and develop robust infrastructure. Drawing inspiration from global benchmarks, India can develop integrated chemical hubs that offer world-class infrastructure and foster innovation. Additional incentives such as tax benefits, interest subventions, and capital subsidies can further stimulate industry growth, making India a more attractive destination for chemical manufacturing investments and enhancing its global competitiveness and sustainability.

1

Introduction: India in brief

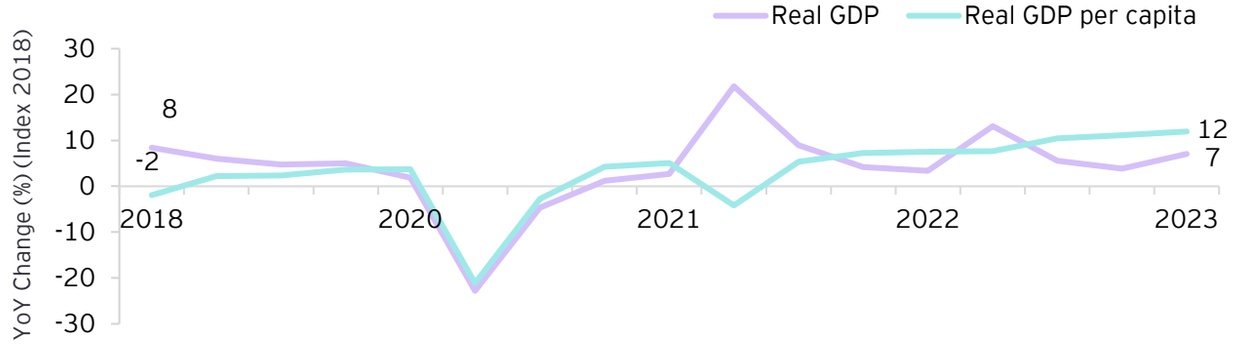
Macroeconomic overview

India is the largest democracy in the world, with a 968 million[1] strong electorate and home to the largest English-speaking population. It is the fifth-largest economy in the world by nominal GDP and the third largest in Asia and is expected to rise to the third spot globally, overtaking Japan and Germany by 2028[2]. A total of four cities in India are among the world's top 10 fastest-developing cities[3]. The consumer spending in India is expected to grow to nearly US$4 trillion by 2030.[4]

The performance in FY24 has been remarkably resilient

Despite the challenges posed by COVID-19, the Indian economy exhibited remarkable resilience in FY24, surpassing pre-pandemic FY20 levels with a 20% increase in real GDP. India's economy experienced a robust growth in FY24, with a real GDP expansion of 8.2%. Furthermore, this growth surpassed the 8% threshold in three quarters of the fiscal year, primarily due to consistent consumer demand and a progressive increase in investment demand. Manufacturing sector grew by 9.9% in FY24, and construction activities registered a growth of 9.9%. Retail inflation has eased to 5.4% in FY24 following an average of 6.7% in FY23.[5]

GDP per capita is returning to its growth trajectory

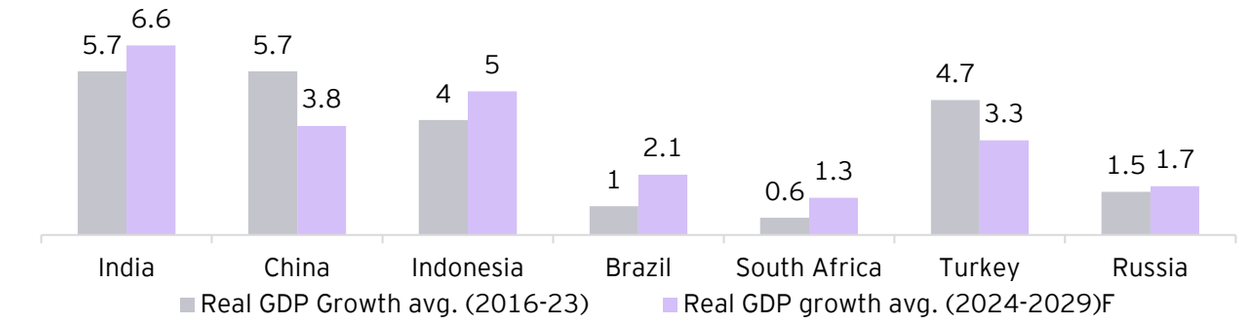


Source: OECD – Country Economic Outlook

India is poised to outpace all emerging markets

India is expected to experience strong economic growth over the next 20 years. The baseline real GDP growth is projected to be at least 6.5%, with nominal GDP growth between 10.5% and 11%. This growth is higher than other emerging markets due to strategic reforms focused on formalization, digitization, privatization, urbanization, financial sector liberalization, and improvements in infrastructure and manufacturing. According to forecasts, the Indian economy is likely to double to US$7 trillion by the end of this decade. Per capita income is also expected to nearly double to US$4,500 by 2030.[6]

Sources: PIB, IMF, Deutsche Bank, EY analysis



Source: IMF and Deutsche Bank forecast

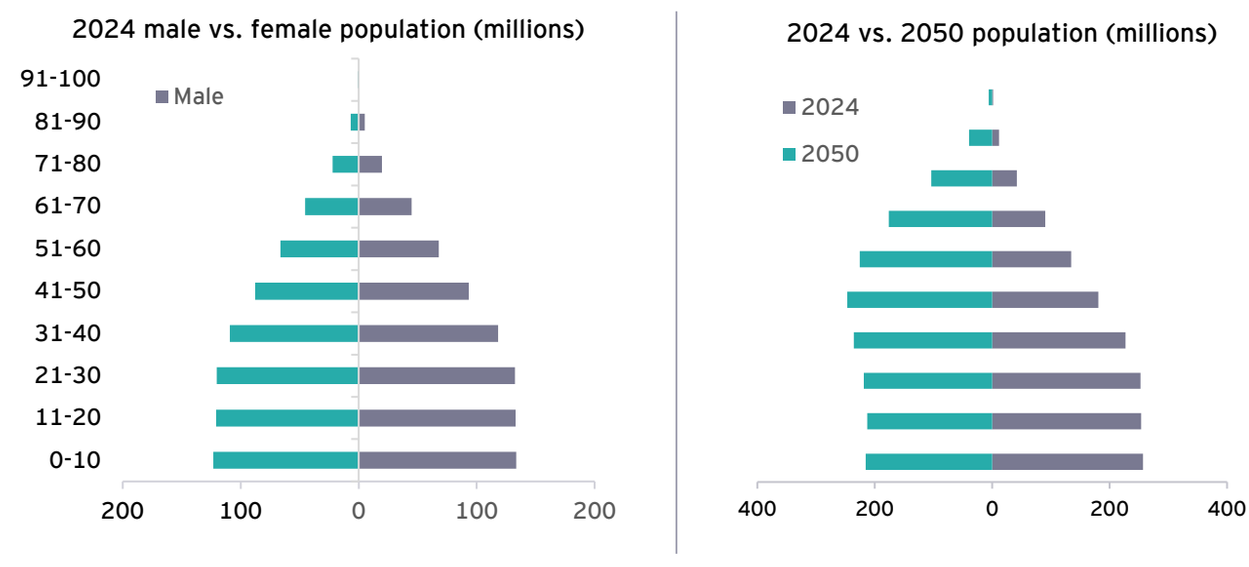
Social and political environment

Expanding urban youth set to drive overall demand

According to the UN, as of 1 July 2024, India's population has reached 1.45 billion, beating China and making it the world's most populous country and comprising nearly 17.8% of the global population.

- In 2023, urban residents accounted for 36.3% of the total population, which is over 520 million people. By 2035, it is estimated that India's urban population will reach 675 million, making it the second largest after China's 1 billion. The urbanization rate is expected to be 43%.
- With a median age of 28.4 years and approximately 68% of the populace from age 15 to 64, India boasts the largest youth demographic globally, offering significant potential for economic expansion and innovation.[7]

India's expanding workforce promises a sustained demographic dividend, yet challenges such as employment scarcity, gender disparities, and skill shortages may hinder its full potential. Urban migration is set to intensify infrastructure demands, with agriculture remaining the primary rural employer. Urban employment is expected to shift towards construction, basic manufacturing, and services, necessitating workforce upskilling and technological integration.



Source: UN (Department of Economic and Social Affairs, Population Division)

Political stability and future outlook

India's macroeconomic landscape has significantly benefited from its political stability, which has been a key factor in its progress. The current government has achieved its third consecutive legislative election victory in 2024. Despite the government's reliance on a coalition to maintain a parliamentary majority, political stability may not be challenged owing to underlying policy synergies with key coalition partners.

The government has reinforced its policy towards private enterprise and competition with reforms, such as regulatory and tax simplifications, digitalization of online permits and licensing processes along with privatizing inefficient state-owned companies and monetizing infrastructure assets. This has led to significant improvement in the government's operational efficiency and transparency, reducing bureaucratic friction and malpractices.

Sources: The Economist Intelligence Unit (EIU), UN, IMF, Deutsche Bank, EY analysis

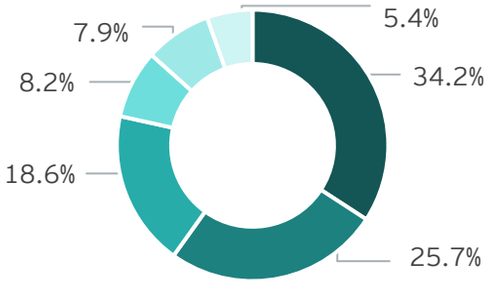
Manufacturing overview

Manufacturing sector's contribution to India's GDP: key facts and figures

The Indian manufacturing sector, contributing approximately 17% to the national GDP, is poised for rapid expansion and is forecasted to be one of the fastest-growing sectors in India. By the fiscal year 2025-26, the manufacturing industry in India is anticipated to scale up to a US$1 trillion market. The manufacturing sector had a significant recovery in 4Q24 with a 9.9% increase, marking a rebound from the previous year's downturn.

India's manufacturing industry witnessed its fastest expansion in 16 years in March 2024, with India's Manufacturing Purchasing Managers' Index (PMI) soaring to 59.1, the highest since February 2008. India's manufacturing gross value added (GVA) was estimated at US$128.1 billion (25% of total GVA) in 4Q24. The overall intent to hire, across manufacturing and services sectors combined, increased from 61% in 2Q24 to 65% in 3Q24 and is projected to cross 70% in the next few quarters. This surge was fueled primarily by increased demand, resulting in notable improvements in new orders, output, input stocks, and job creation.[8]

Value added from manufacturing by industries for FY22 (% of share)



Note: The share of manufacturing of chemicals and chemical products contributing to the overall manufacturing GVA has risen from 8.8% in FY19 to 10.4% in FY22

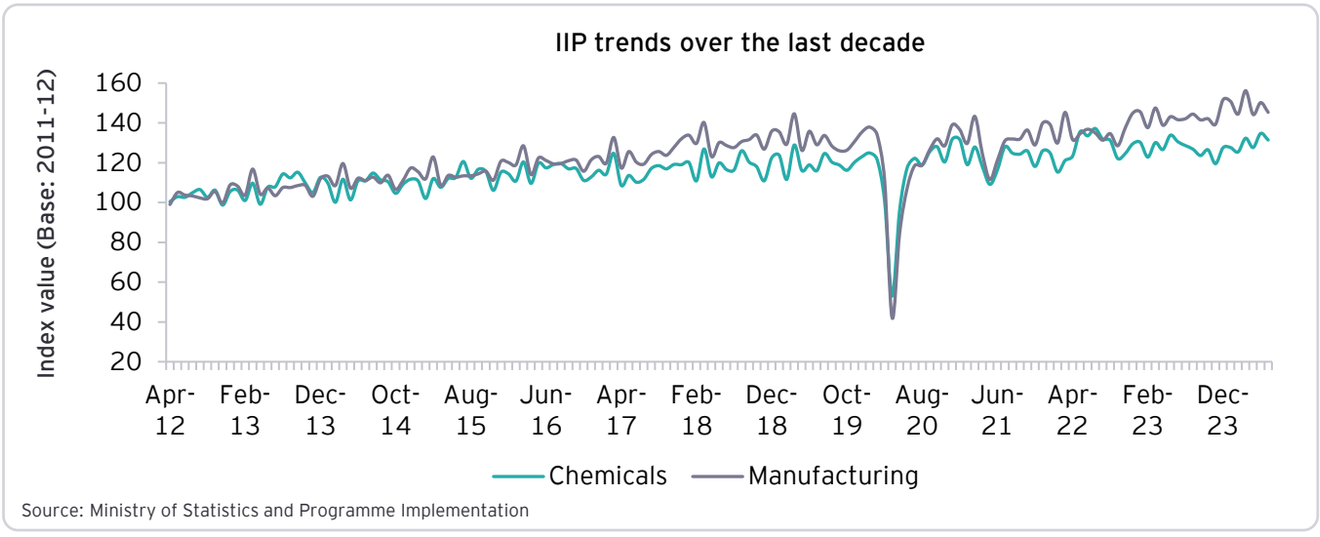
Source: Ministry of Statistics and Programme Implementation

IIP comparison between overall manufacturing and manufacturing of chemicals

Index of Industrial Production (IIP) is the benchmark index and serves as a proxy to gauge the growth of the manufacturing sector of India since manufacturing alone has a weight of 77.6% in the index.[9] The chemicals manufacturing segment plays a critical role in driving growth across various industries, including food and beverage, textiles, leather, metal processing, petroleum refining, pharmaceuticals and rubber.

In the four years following the COVID-19 pandemic, both the overall manufacturing IIP and the chemicals manufacturing segment have shown consistent growth, surpassing pre-COVID levels. In 2Q24, the manufacturing sector posted remarkable growth of 13.9%, exceeding forecasts and contributing significantly to India's GDP expansion. This strong performance can be attributed to a favorable base effect, reduced input cost pressures, and increased government expenditure, which have collectively driven Gross Fixed Capital Formation (GFCF) and corporate investments.[10]

Sources: IBEF, MoSPI, EY analysis

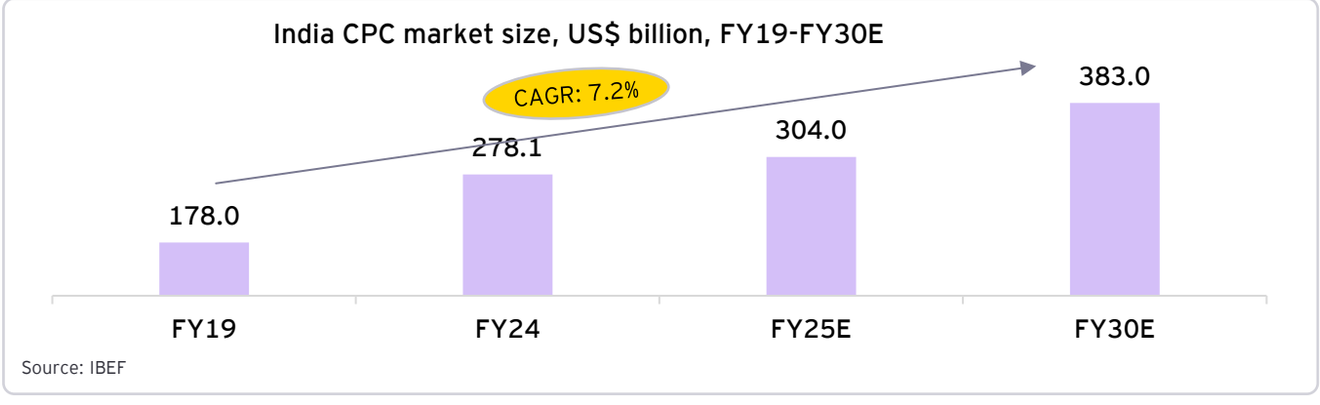


Source: Ministry of Statistics and Programme Implementation

Economic factors affecting the CPC industry as a whole

Strong growth in market size driven by rising demand

The Indian chemical industry was valued at US$254.3 billion in FY23 and is expected to grow at a CAGR of 7.2% from FY19 to FY30, to reach US$383 billion by FY30. This growth is driven by rising demand in end-user segments for specialty CPC. Demand for CPC in India is projected to nearly triple, reaching US$1 trillion by 2040.[11]



Source: IBEF

India's CPC industry is poised for significant growth, with a focus on alternative feedstocks such as coal gasification, syngas, and pet coke to reduce reliance on imports. This shift aims to boost self-sufficiency and support downstream chemical production to meet rising demand. Petrochemicals are expected to lead the expansion, with a planned US$100 billion investment by 2030 to address the petrochemical supply gap and support specialty chemical production for consumer goods.[12]

The specialty chemicals segment has strong growth potential, with opportunities for increased market penetration given low domestic consumption. Rising incomes and urbanization are expected to drive demand for products such as paints and personal care items, further boosting consumption. Indian firms are also positioned to benefit from export opportunities, as stricter environmental regulations in China raise costs for Chinese exporters and US-China tensions prompt global players to seek alternative suppliers, favoring Indian companies.

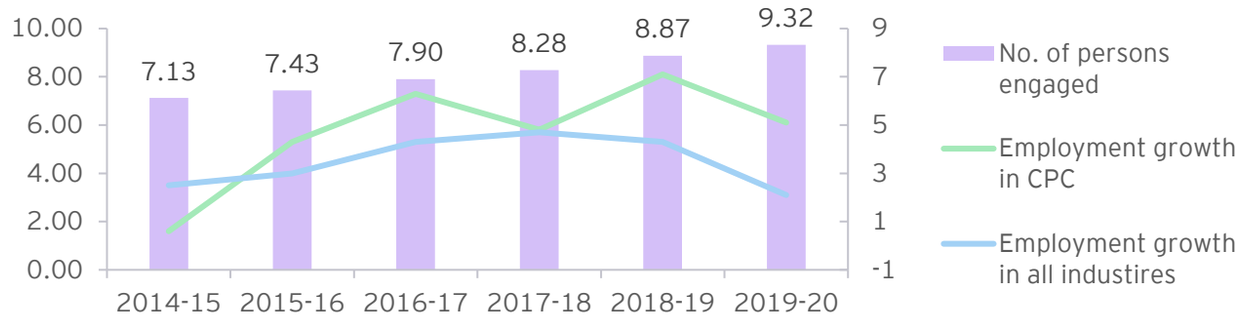
Sources: IBEF, DCPC, MoCF, EY analysis

Industry's consistent growth in employment

Employment in the CPC industry in India has demonstrated a consistent upward trend. This growth is driven by the increasing demand for chemical products and the Indian government's initiatives to promote the chemical sector as a key area for development and investment.

The chemical industry's share of total industrial employment has also experienced a slight increase over the years, with its growth rate outpacing the industry average. This trend indicates that the chemical industry is becoming a more significant player in the country's industrial employment landscape.

India's CPC employment statistics (in millions)



Source: DCPC, MoCF

Contribution of the Indian chemicals industry to India's GDP

India's chemicals industry is a significant global player, ranking sixth worldwide and third in Asia, representing about 2.6% of global chemical sales. The sector produces over 80,000 types of chemicals serving an array of sectors, such as textiles, automotive, agriculture, packaging, pharmaceuticals, healthcare, construction and electronics.[13]

As a cornerstone of the Indian economy, the chemical industry plays a vital role in the country's economic development. It includes a wide range of large, medium, and small firms that produce various chemicals, including petrochemicals, alkali chemicals, inorganic and organic chemicals, pesticides, dyes, and pigments. The share of chemical manufacturing in the overall manufacturing GVA increased from 8.8% in FY19 to 10.4% in FY22.[14] In FY23, India exported chemicals to over 175 countries, with the US and China as major destinations. Additionally, Turkey, Russia, and North-East Asian regions—including China, Japan, South Korea and Mongolia—have emerged as key new markets.

Industry Demand

US$1t

expected demand for CPC in India by 2040

Chemical Production

Sixth

largest producer of chemicals globally (2023)[15]

Polymers

Third

largest polymer consumer globally (2023)[15]

Specialty Chemicals

11%

expected CAGR for the Indian specialty chemicals market (2023-2029)[13]

Chemical Exports

Sixth

largest exporter of chemicals globally (2023)[15]

Chemical Exports

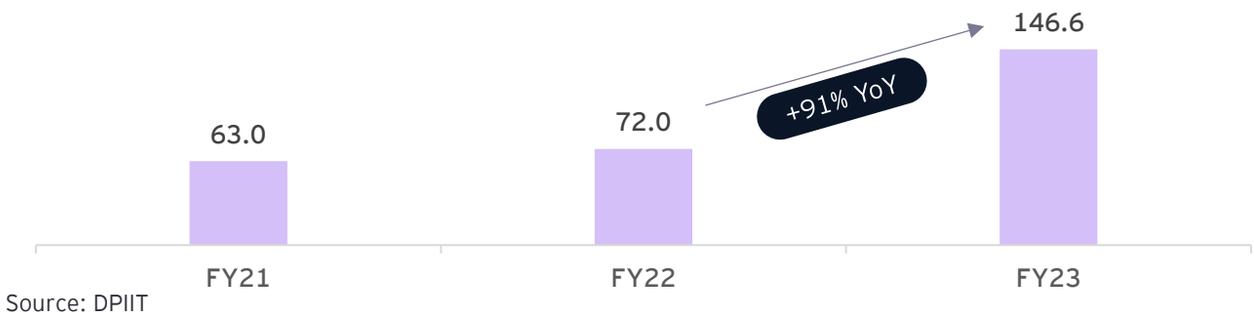
12%

average share in total national exports (2023)[15]

FDI inflows: significant year-on-year growth

The chemicals sector ranks sixth in total Foreign Direct Investment (FDI) in India, contributing approximately 3% of the nation's overall FDI equity inflows. It recorded the highest year-on-year growth rate of 91% in FY23 among all sectors. In FY23, the Indian chemical industry attracted FDI of INR146.6 billion, a substantial rise from INR72 billion in FY22 and INR63 billion in FY21. The government permits 100% FDI through the automatic route in the chemicals sector, eliminating the need for special approvals, except for certain hazardous chemicals.[16]

FDI Inflows in India, FY21-FY23, INR billions



Source: DPIIT

2

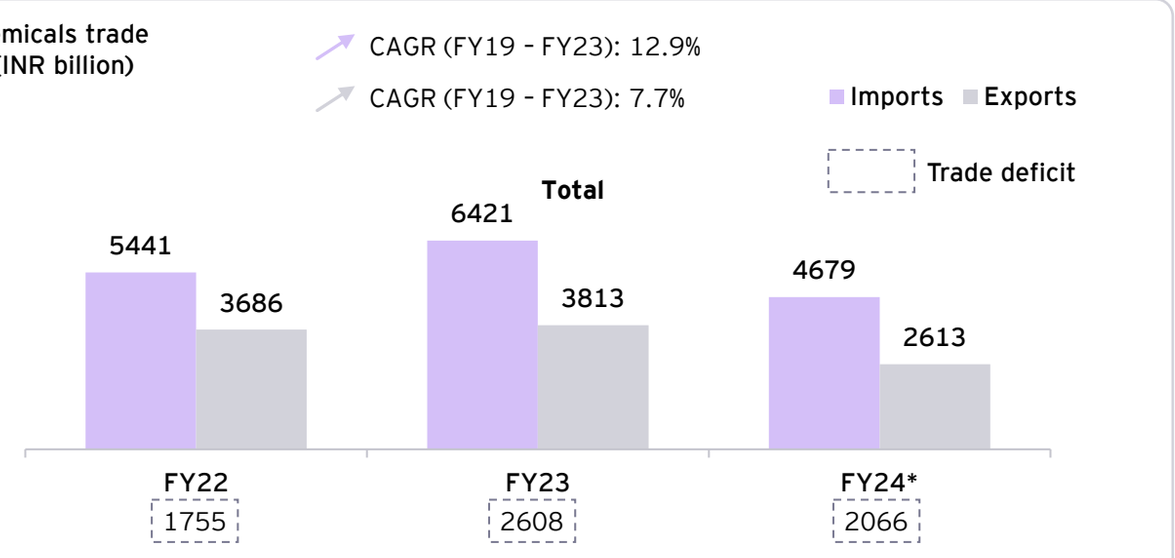
Industry overview: chemicals and petrochemicals

Performance in the past year: CPC

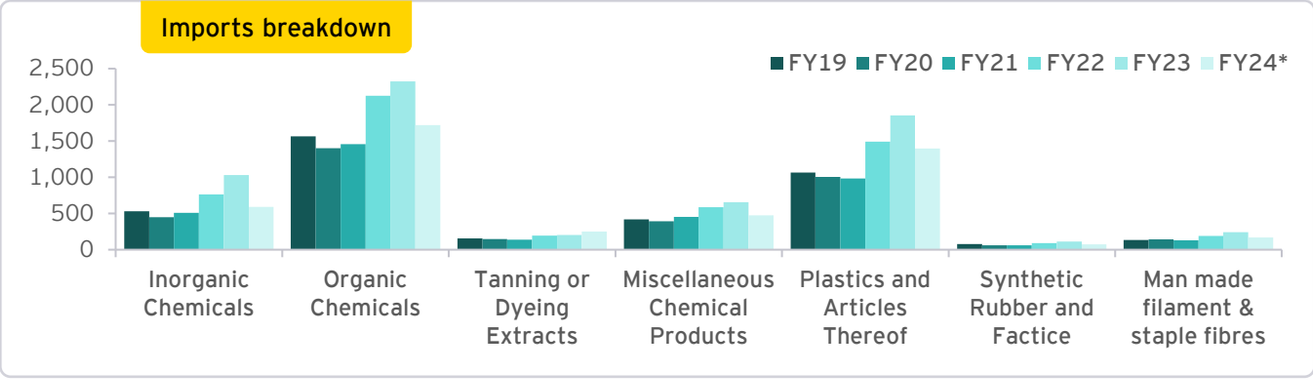
Import and export trend: a widening trade deficit

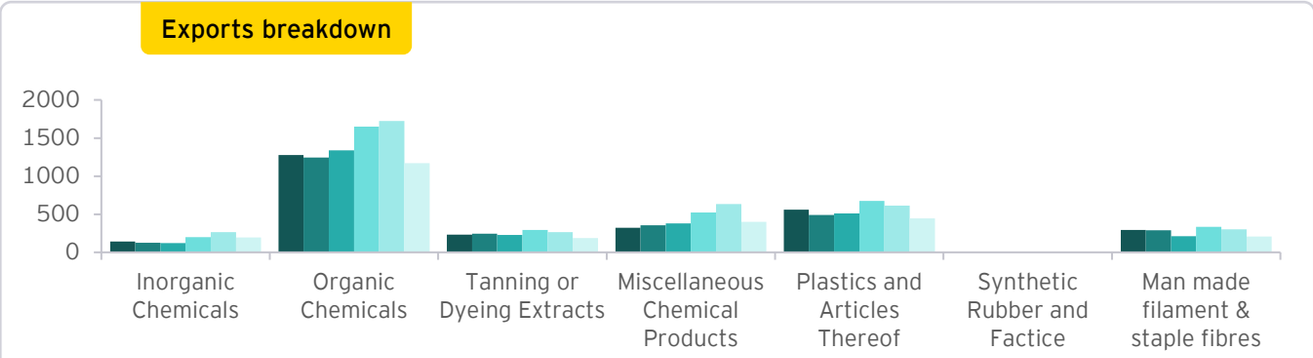
India stands as a major global chemical producer and exporter, with a broad expertise across various chemical product categories. Despite these strengths, India's trade deficit has escalated, rising 50% YoY in FY23 due to increasing import reliance and stagnant exports.[17] Major countries importing from India are experiencing a demand slowdown and expanding their internal capacities, which is impacting Indian exports and industry margins.

India chemicals trade balance (INR billion)



*FY24 data is up to Dec'23





Source: DCPC, EY analysis

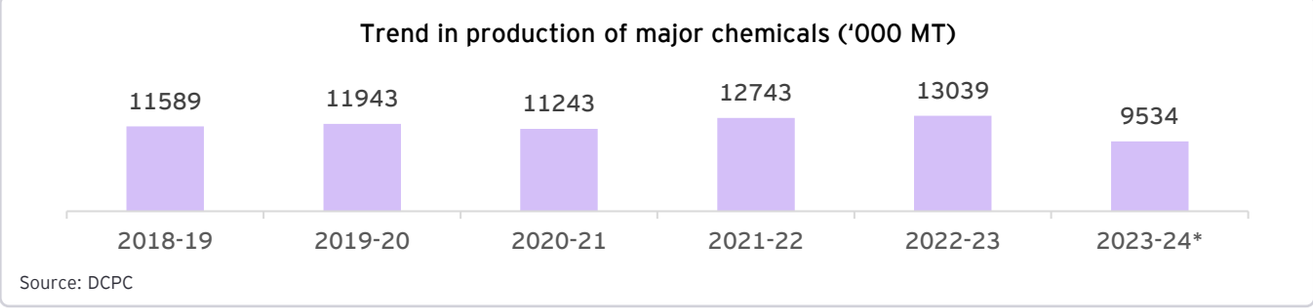
The specialty chemicals segment is expected to drive exports growth. It has shown a consistent growth of around 5% over the past four years. India could remain a net exporter in the segment, driven by agrochemicals, dyes and pigments, cosmetics/personal care, and food ingredient chemicals that account for around 80% of total Indian specialty chemical exports.[17] While exports in the inorganic chemicals segment have grown steadily, the segment remains reliant on imported raw materials such as phosphorus, potassium, and titanium.

The Department of Commerce has played a key role in boosting chemical exports through promotional activities, financial support, and aid in overseas product registration. Despite this, India struggles to produce high-value and innovative specialty chemicals, leading to a reliance on imports. Indian chemical firms typically invest only 1% to 2% of their revenues in R&D, well below the global average of 6% to 10%. Additionally, the high capital costs associated with establishing new petrochemical capacities and high-power blending costs have made Indian industries dependent on imports.

The Indian government aims to decrease the nation's import expenses by promoting import substitution while also positioning the chemical sector as a pivotal contributor to export growth. Policy measures include fostering industrial clusters, such as petrochemical zones and plastics parks, and offering financial support to exporters via the Remission of Duties or Taxes on Export Products (RoDTEP) scheme. Additionally, the potential approval of the Production-Linked Incentive (PLI) scheme could further amplify export capabilities by providing tax rebates to chemical producers for establishing manufacturing facilities in India.

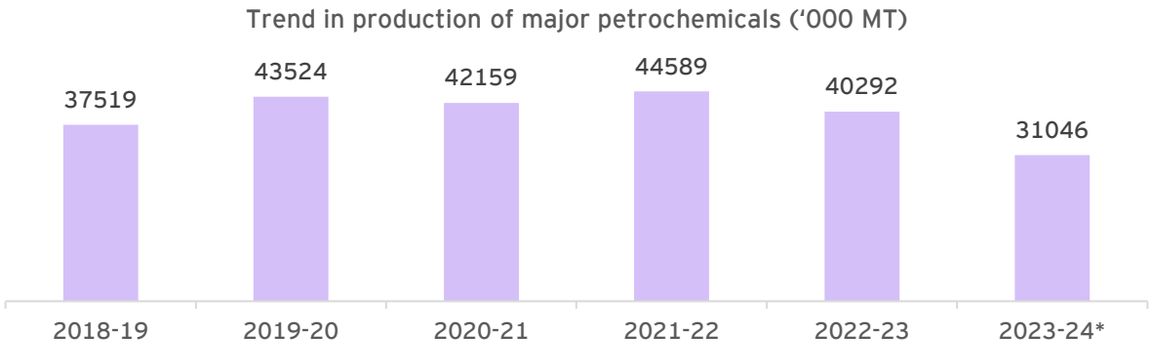
Chemicals and petrochemicals production trends

The production of major chemicals in 2023-24 (up to December 2023) was 9,534 KT. Production of total major chemicals during the period 2018-19 to 2022-23 grew at a CAGR of 3.0%.



Source: DCPC

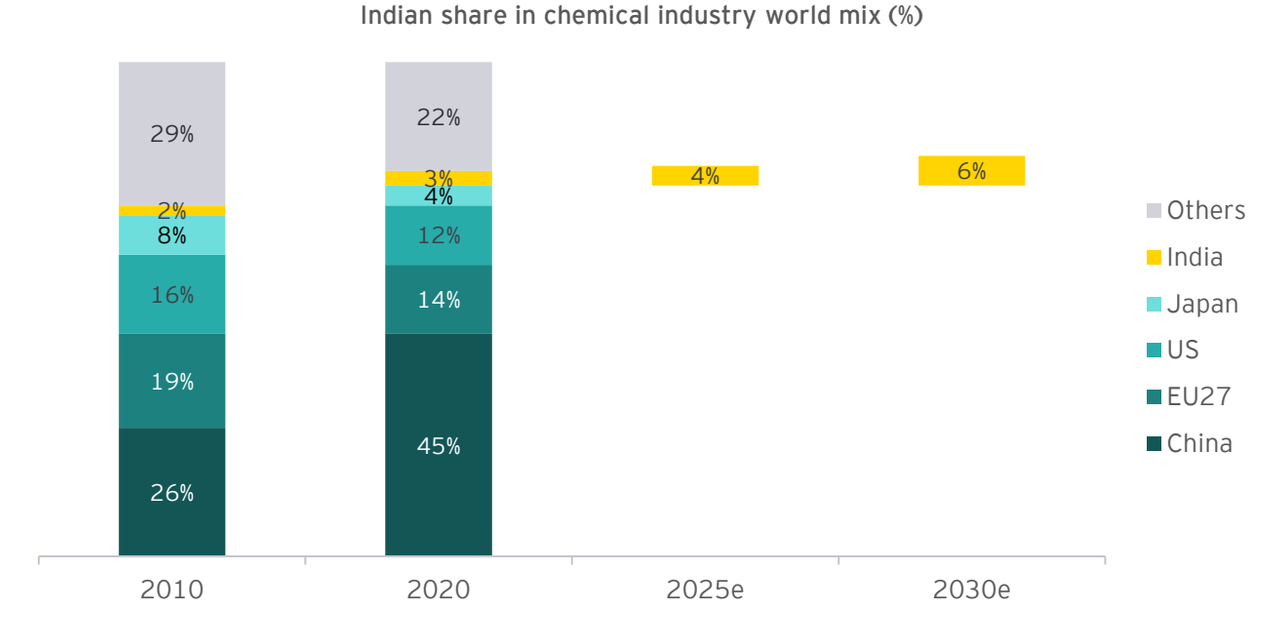
The production of major petrochemicals in 2023-24 (up to December 2023) was 31,046 KT. The CAGR in production of major petrochemicals during the period 2018-19 to 2022-23 was 1.8%.



*2023-24 production data is up to December 2023

Forecasts: significant upside potential for the Indian chemical industry

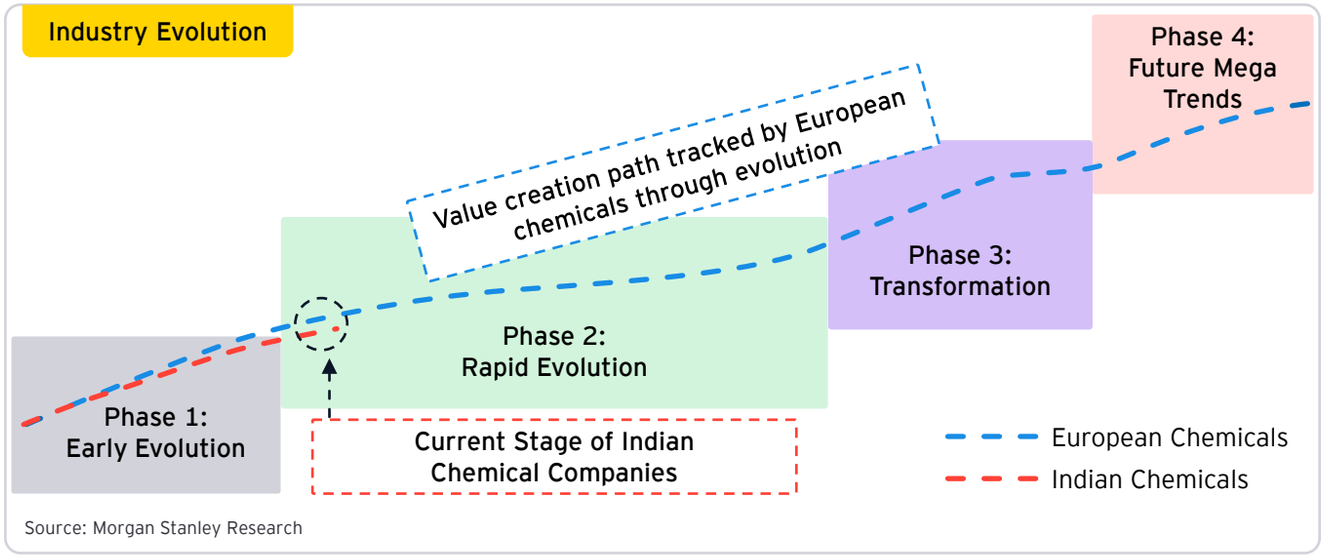
The Indian chemical industry has maintained its position as the sixth and third largest producer of chemicals in the world and Asia, respectively. However, it is still a small part of the global value chain, contributing about 2.6% to the global chemical industry and is expected to reach US$304 billion by 2025. India is expected to be well positioned to capture a larger share of the global CPC markets through 2030, doubling its share from 2020.[18]



Source: CEFIC, Morgan Stanley Research

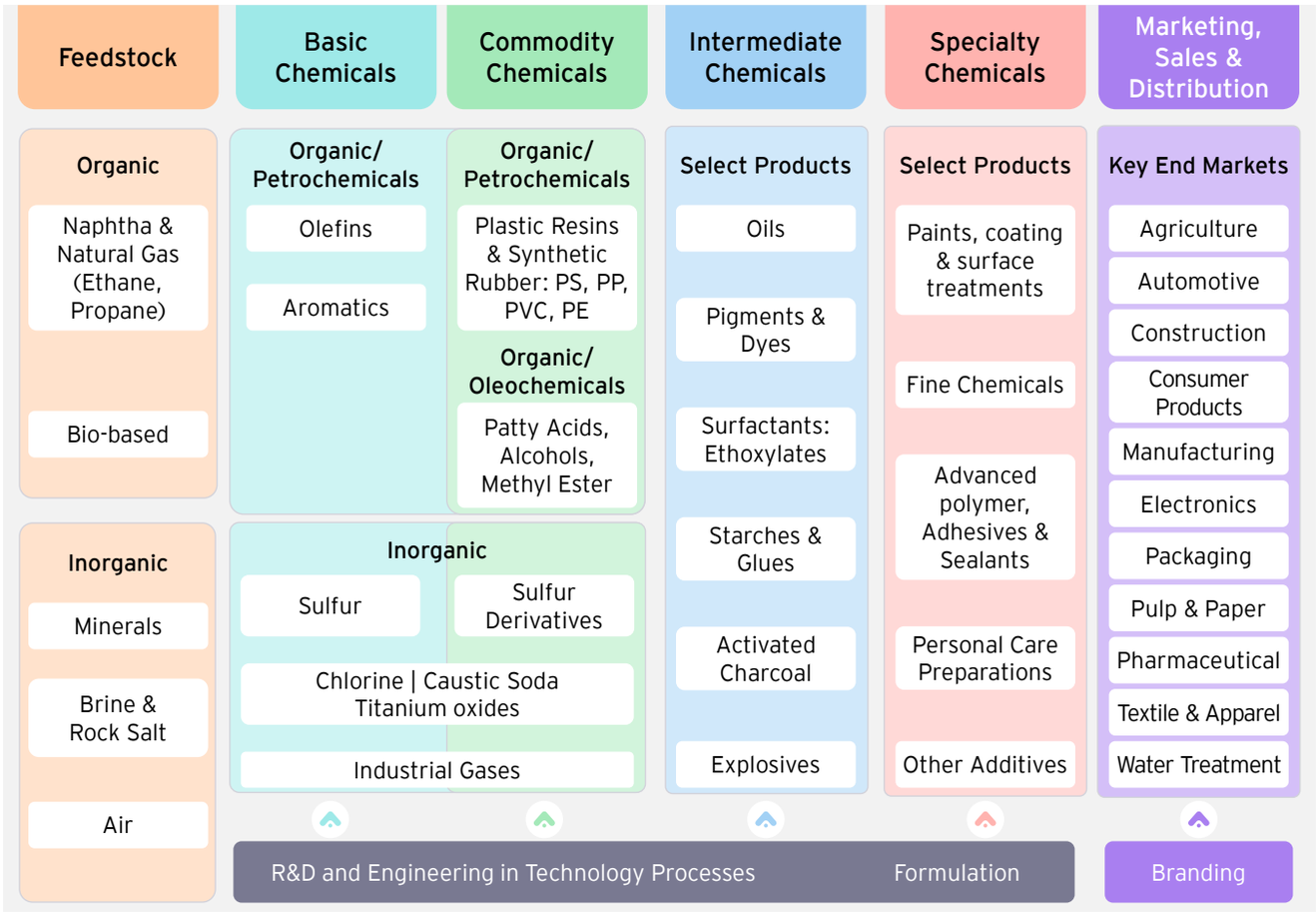
The Indian chemicals industry exhibits significant upside potential as companies expand product offerings, since India chemicals are tracking a path similar to their European peers, which saw value creation of over US$200 billion since 2005. Indian chemicals industry is at the second stage of the value-creation cycle with multiple upside levers ahead, including rapid expansion by investments and added capacities, transformation through vertical integration and other future mega trends.[18]

Sources: DCPC, EY analysis



Sources: CEFIC, Morgan Stanley, EY analysis

Value chain mapping of India's CPC sector

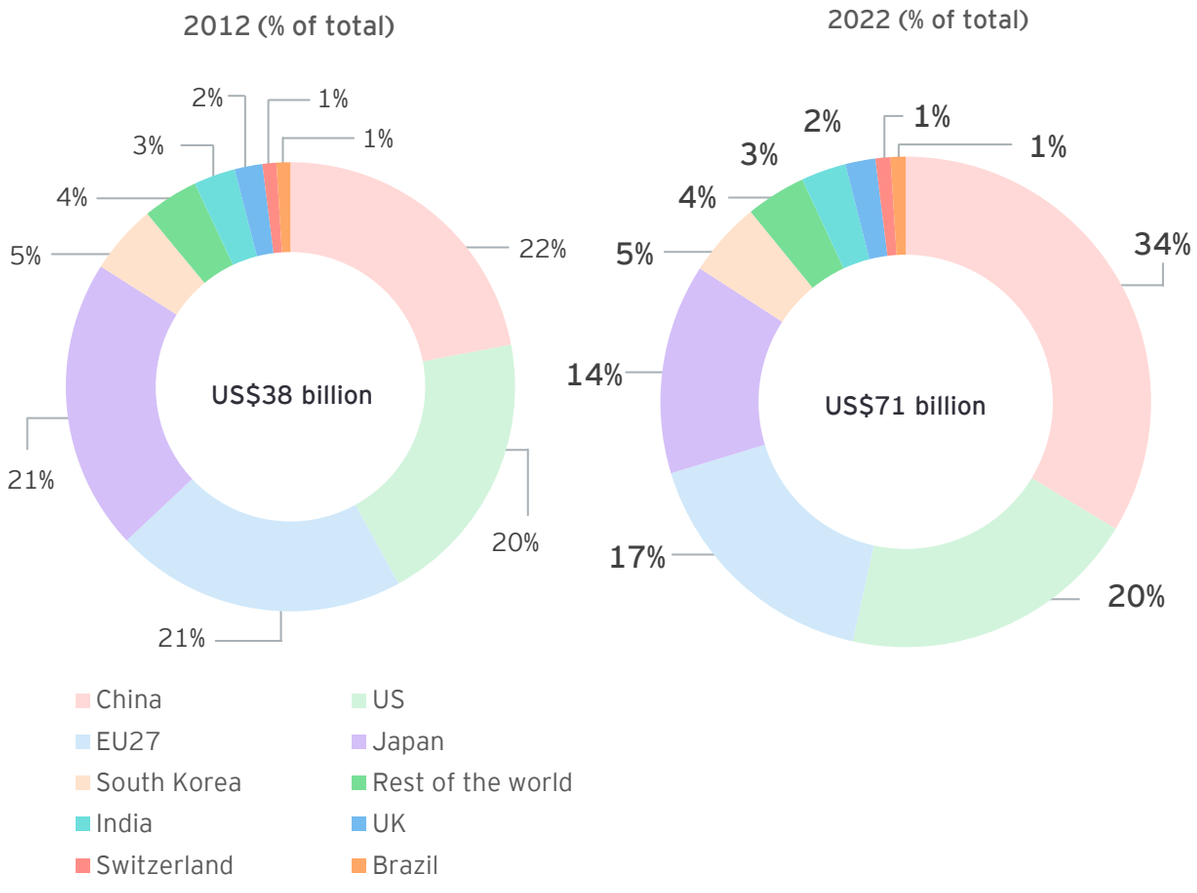


Source: secondary research, EY analysis

R&D scenario in the Indian CPC sector

Indian chemical firms have recognized the significance of R&D, leading to substantial investments in this area, which has resulted in innovative and efficient products with added value. During the FY15-22 period, the average R&D spending for 21 major Indian chemical companies was approximately 0.6% of annual revenue. These companies, excluding newly listed entities, saw their R&D expenditure grow at a 13% CAGR from FY12 to FY22, surpassing their revenue growth rate of 9% during the same period. In FY22, they allocated INR 5.9 billion to R&D, a significant increase from INR 1.8 billion in FY12.[19]

Chemicals R&I spending by Country



Source: Cefic Chemdata International Note: Conversion rate – EUR1 = US$1.09

Indian chemical companies are bolstering their R&D teams to drive innovation, benefiting from India's cost-effective skilled talent pool. India's global R&D expenditure share in the chemical sector increased from 2.8% in CY10 to 3.8% in CY20, with only India, China, and South Korea seeing growth in this period. Indian firms are striving to align their R&D capabilities with global standards, aiming to ascend the value chain.[19]

The global chemical industry recognizes the value leadership of Indian manufacturers, who are emphasizing R&D and process engineering, and are adept at handling complex chemistries. This shift in perception has resulted in increased inquiries and demand from international players.

Sources: CEFIC, HDFC Securities, News Articles, EY analysis

3

Chemical hubs or clusters in India: snapshot and way forward

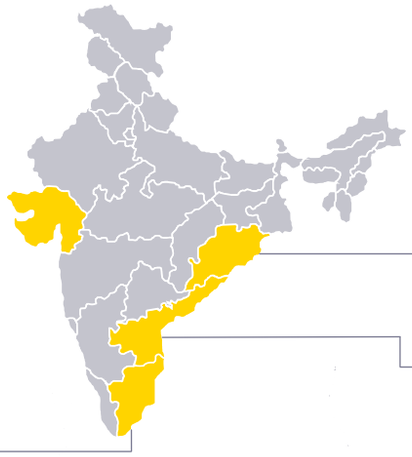
Status of present clusters: PCPIRs and Plastic Parks

Petroleum, Chemicals, and PCPIRs are specifically delineated zones in India designed to attract investment in the petroleum, chemicals, and petrochemical sectors. These regions are intended to provide world-class infrastructure and promote the growth of these industries through a combination of policy support, incentives, and streamlined regulations. Modeled on clustering operations like Singapore's Jurong Island, PCPIRs are vehicles that can boost production over the long term, using a higher offtake of refinery output.

India has 4 PCPIRs at various stages of implementation and development:

Location/Region: Dahej
Actual investment: INR1.3 trillion
Total area: 453 Sq. Kms
Employment generated: 245,000
Anchor tenant: ONGC
Investors: RIL, OPaL, ONGC, GACL, Petronet LNG, BASF, ABG, Adani, Welspun, Godrej & Boyce, GAIL, GSPC, Pidilite, Grasim, NOCIL

Location/Region: Cuddalore – Nagapttinam (ON HOLD)
Actual investment: INR81 billion
Total area: 257 Sq. Kms
Employment generated: 13.950
Anchor tenant: Nagarjuna Oil Corp.
Investors: Al Kharafi, Chennai Petroleum Corporation, Tanfac Industries, Asian Paints, Covestro, Saint Gobain



Location/Region: Paradeep
Actual investment: INR735 billion
Total area: 284 Sq. Kms
Employment generated: 40,000
Anchor tenant: IOCL
Investors: Paradeep Phosphate, Paradeep Carbon Ltd, IFFCO, Deepak Fertilizers

Location/Region: Vishakhapatnam-Kakinada
Actual investment: INR410 billion
Total area: 640 Sq. Kms
Employment generated: 85,000
Anchor tenant: HPCL
Investors: Total, OIL, Saudi Aramco, GAIL, Vizag Steel, NTPC, Sanvira Industries, Asian Paints, Hetero Pharmaceuticals

Sources: IBEF, DCPC, GCMPH 2023, EY analysis

Dahej (Gujarat) Cluster

Gujarat PCPIR is under implementation at Dahej in Bharuch district, over an area of 453 sq. km and is strategically positioned to the east of the Delhi-Mumbai Industrial Corridor and near the western coastline. The anchor tenant, M/s ONGC Petro Additions Ltd. (OPaL), has established a dual feed cracker facility within Dahej SEZ, boasting an annual production capacity of 1.1 MMTPA of ethylene and 0.6 MMTPA of propylene, complemented by corresponding downstream polymer units. It has invested INR30,800 crore in the project's execution and commissioning, completed in 2017.[20] Major investors in the region include Reliance, BASF, Aditya Birla, Welspun, GACL, Adani, SRF, GSPL, Torrent and LANXESS.[21]

Vizag (AP) Cluster

The Vishakhapatnam PCPIR, India's largest by area, spans from Visakhapatnam to Kakinada and hosts key industries such as the HPCL Visakh Refinery, Coromandel Fertilizers, NTPC Simhadri Power Plant, and Andhra Petrochemicals. The Kakinada area includes seven power projects and two chemical and fertilizer plants. It covers six existing SEZs, and the committed investment is INR51,500 crore. Investment of INR1,950 crore has been made on infrastructure development. A significant ongoing investment is the HPCL Visakh Refinery expansion, which will boost capacity from 8.33 MTPA to 15.0 MTPA, requiring an investment of INR20,900 crore. The project's original completion date of July 2020 has been delayed, with no updated timeline provided. In June 2021, Andhra Pradesh's Industries Minister announced the Central government's support for a new INR 25,000 crore petrochemical corridor in the state.[20]

Paradeep (Odisha) Cluster

The Paradeep PCPIR, spanning 284 sq. km across Kendrapara and Jagatsingpur districts in Odisha, is under development. The master plan has been completed and awaits submission to the Government. Meanwhile, the Odisha Industrial Infrastructure Development Corporation (IDCO), the project's implementing agency, has petitioned the Odisha government to extend the jurisdiction of the Paradeep Development Authority. IFFCO, Paradip Phosphates, Paradip Carbon and Deepak Fertilizers & Petrochemicals are a few of the major investments made in the PCPIR region. The first phase was initially expected to be completed by 2015, with the entire project commissioned by 2030, but has been beset with delays. The first phase completion was pushed back to 2020, with no timeframe for commissioning. Currently, a detailed Environmental Impact Assessment (EIA) is being undertaken by Environmental Protection Training and Research Institute (EPTRI), Hyderabad.[21]

Plastic Parks

The initiative is designed to establish specialized Plastic Parks that provide state-of-the-art infrastructure and shared facilities to enhance the efficiency and competitiveness of India's plastic processing industry through a cluster-based model. The overarching goal is to boost the economy by attracting investment, increasing production and exports, and creating job opportunities within the sector. The GoI offers grants covering up to 50% of the project costs, with a maximum of INR40,000 crore per project. The balance is financed by State Governments, their agencies, and the industries benefiting from the parks.[20]

To date, 10 Plastic Parks have been sanctioned across various states – two in Madhya Pradesh, and one each in Odisha, Jharkhand, Tamil Nadu, Uttarakhand, Chhattisgarh, Assam, Uttar Pradesh and Karnataka. These parks are at various stages of development.

Sources: DCPC, BMI, EY analysis

List of approved Plastic Parks

Location	Final approval	Land area (acre)	Total no. of plots	Total project cost (INR crore)	Total approved grant-in-aid (INR crore)
Tamot, MP	09.10.2013	122	155	108.0	40.0
Jagatsinghpur, Odisha	09.10.2013	120	80	106.8	40.0
Tinsukia, Assam	21.02.2014	173	104	93.65	40.0
Deoghar, Jharkhand	20.12.2018	93	107	67.3	33.7
Bilaua, MP	20.12.2018	93	107	68.72	34.36
Thiruvallur, TN	05.09.2019	240	65	216.9	40.0
Sitarganj, Uttarakhand	03.12.2020	40	45	67.7	33.9
Sarora, Chhattisgarh	13.04.2021	47	55	42.1	21.0
Ganjimutt, Karnataka	21.01.2022	112	53	62.8	31.4
Gorakhpur, UP	13.07.2022	88	92	69.6	34.8

Source: DCPC Annual report 2023-24

Challenges

Structural constraints

PCPIRs have struggled to gain momentum due to structural constraints, in particular the slow pace of land acquisition and environmental approvals. The government is reviewing the PCPIR policy to speed up the process, although the controversies surrounding land acquisitions are unlikely to be easily resolved. India is in competition with hubs in China, Singapore and the Middle East, which lead the world in terms of competitiveness. Without the development of PCPIRs, India will face challenges in competing with them.

Withdrawal of Cuddalore PCPIR proposal

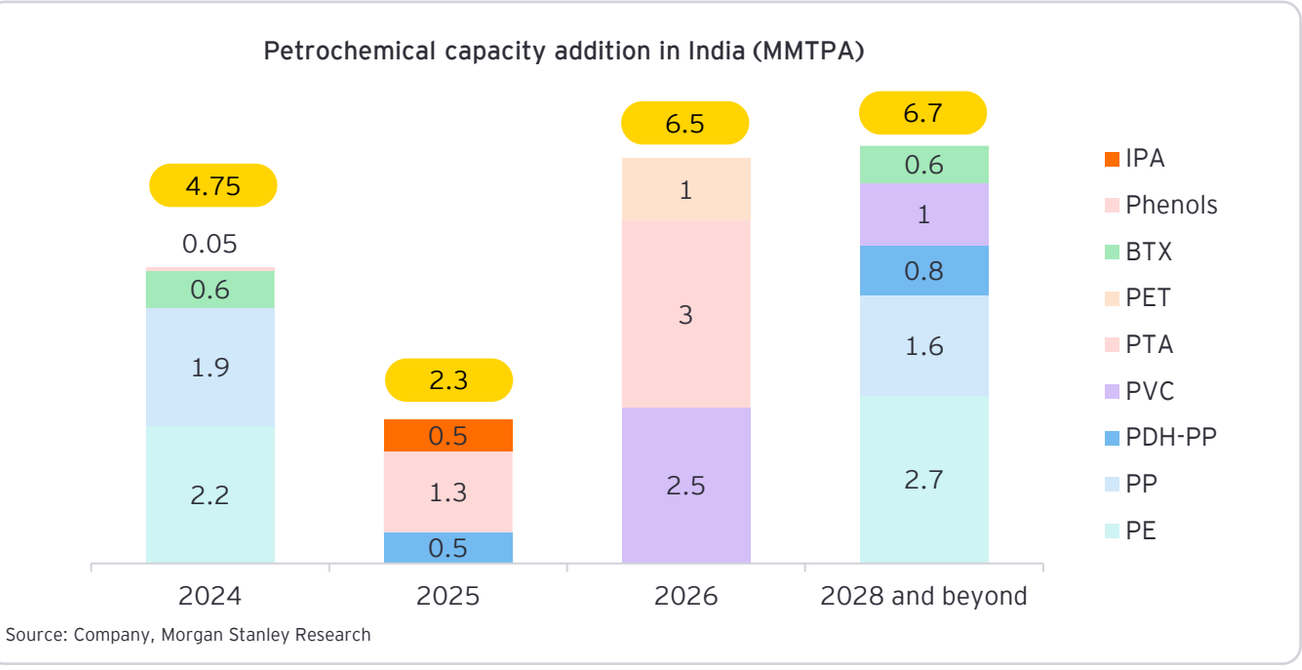
The Cuddalore PCPIR, designated in 2017 in Tamil Nadu's Cuddalore and Nagapattinam districts, has seen limited progress. In November 2021, plans for a Nagapattinam cluster were abandoned due to substantial local resistance. The Government of Tamil Nadu subsequently withdrew the entire PCPIR proposal, responding to protests against the project's impact on the Cauvery delta's agrarian lands. However, the state is advancing three industrial initiatives, including a Thoothukudi-based oil refinery and petrochemical complex by Al Kharafi, Chennai Petroleum Corporation, and IOC, as well as a Haldia Petrochemicals petrochemical project in Cuddalore.

Sources: DCPC, BMI, EY analysis

Chemical cluster hub potential of India

Large-scale capacity expansion around petrochemical complexes

The Indian government is planning to set up petrochemical complexes around all the country's 22 refineries. The drive demonstrates the administration's commitment to establishing petrochemicals hubs, a long-term goal pursued by its predecessors. Clustering will reduce operational costs and involve greenfield and brownfield development. Companies are also looking to add existing capacities and add new facilities for various products and intermediates. India's petrochemical capacity is expected to double over the next seven years.

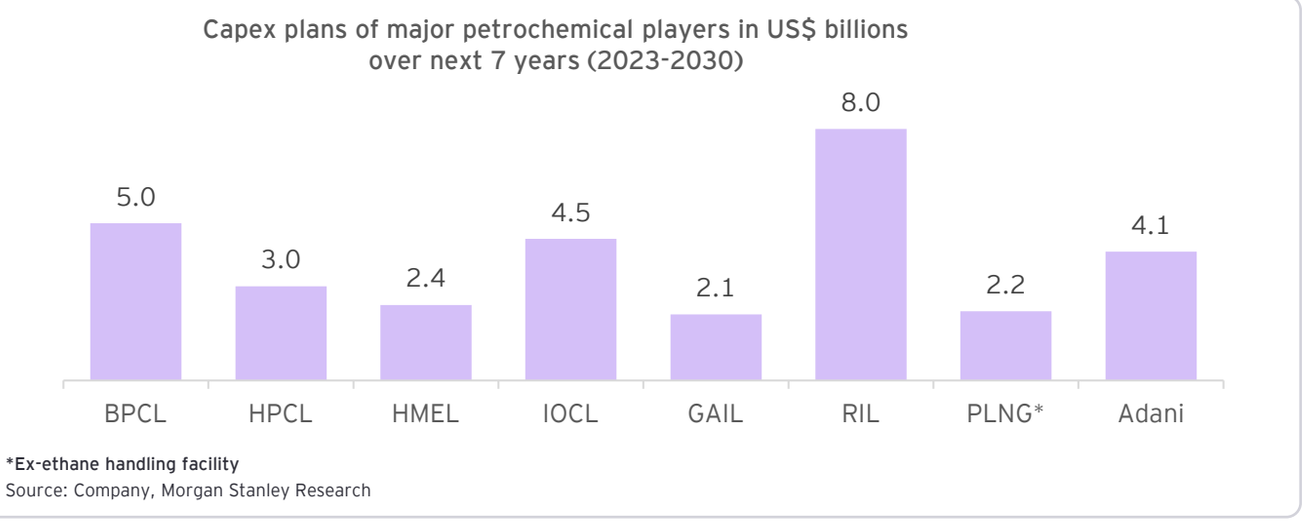


Source: Company, Morgan Stanley Research

India's leading petrochemical companies are set to drive a US$31 billion capex surge, fueling capacity expansion across the sector

India has a persistent petrochemicals trade deficit that will continue to justify investment in new world-scale petrochemicals complexes. Consequently, all major petrochemical players have deployed a significant capex for the next seven years towards capacity expansion and R&D.

RIL has the highest capex spend of US$8 billion with planned capacity addition of 5.5 MTPA on plastics, such as PTA, PET and PVC.[18]



*Ex-ethane handling facility

Source: Company, Morgan Stanley Research

Sources: Morgan Stanley, EY analysis

4

Key policy enablers in India

Petroleum, PCPIR Policy

India's PCPIR policy, initiated in April 2007, is designed to promote the petroleum, chemical, and petrochemical sectors by creating dedicated, sustainable investment regions spanning roughly 250 sq. km, with 40% of the area reserved for processing operations. These regions are regulated according to state-level planning and zoning statutes.

Once a PCPIR proposal receives the green light, the respective state government or its appointed agency undertakes Environmental Impact Assessments in accordance with the Ministry of Environment, Forest and Climate Change (MoEF&CC) terms of reference. Successful evaluations by an expert committee result in the issuance of an Environmental Clearance (EC).

Central to each PCPIR is an anchor tenant, typically a major refinery or petrochemical feedstock company. The central government is committed to ensuring the availability of necessary external infrastructure, including transportation and communication networks, primarily through Public-Private Partnerships, with additional financial support provided via Viability Gap Funding and budget allocations.

The responsibility for the development of PCPIRs rests with the state governments, which assign a nodal department or agency to manage the requisite linkages. A management body established by the state government under appropriate legislation is charged with the development and administration of the PCPIR. Developers or consortia of developers are selected through a transparent process to oversee the internal infrastructure of the PCPIR.

New schemes of petrochemicals

Since 2022, the Department of CPC has implemented the following schemes under the New Scheme of Petrochemicals:

- Setting up of Plastic Parks
- Setting up of Centres of Excellence
- Chemical Promotion and Development Scheme (CPDS)
- National Petrochemicals Awards, now revised as the Petrochemicals Research & Innovation Commendation Scheme

Sources: DCPC, EY analysis

Setting up of Plastic Parks

Plastic Parks are strategically designed industrial hubs, fostering the consolidation and enhancement of the domestic plastic processing sector through a cluster model. These zones are equipped with comprehensive amenities tailored for plastic enterprises, including shared resources such as effluent treatment facilities, state-of-the-art laboratories, R&D centers, vocational training institutes, and efficient logistics solutions.

The parks feature advanced infrastructure and a dedicated plastic waste management system, serving as a pivotal growth catalyst for stakeholders in the plastic industry, encompassing raw material suppliers, processors, machinery vendors, and recycling entities. Developed by state governments with financial backing from the Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilizers, Plastic Parks are poised to attract significant investment and create substantial employment opportunities within the region.

Setting up of Centres of Excellence (CoE)

This initiative is designed to enhance the current state of petrochemical technology and R&D capabilities within India, while also fostering the development of innovative applications for polymers and plastics. During the first phase of the scheme, which concluded in 2017, the Indian government offered financial assistance covering up to 50% of the total project cost, with a cap of INR6 crore. Following the updated guidelines, the maximum government support has been adjusted to INR5 crore.

To date, 13 Centres of Excellence have been established under this scheme. These CoEs are instrumental in driving innovation, fostering industry-academia collaboration, and providing critical resources for research and development in the field of petrochemicals. They serve as hubs for technological advancement, skill development, and knowledge dissemination, contributing to the sector's overall competitiveness and sustainability.

Centre of Excellence	Name of institute	Approval	Total project cost (INR crore)	Approved grant-in-aid (INR crore)
Sustainable Polymer Industry to Research & Innovation (SPIRIT)	NCL, Pune	2011	12.0	6.0
Green Transport Network (GREET)	CIPET, Chennai	2011	19.0	6.0
Sustainable Green Materials	CIPET, Bhubaneswar	2013	15.0	6.0
Advanced Polymeric Materials	IIT, Delhi	2013	12.0	6.0
Sustainable Polymers (Sus-Pol)	IIT, Guwahati	2013	14.7	6.0
Process Development, Wastewater Management in Petrochemical Industries	IIT, Roorkee	2019	13.1	4.4
Bio-engineered Sustainable Polymeric Systems	CIPET, Bhubaneswar	2019	10.0	5.0

Sources: DCPC, EY analysis

Centre of Excellence	Name of institute	Approval	Total project cost (INR crore)	Approved grant-in-aid (INR crore)
Specialty Polymers for Customized Additive Manufacturing	NCL, Pune	2019	5.6	2.8
Polymer Coatings for Decorative, Protective and Strategic Applications	CSIR-IICT, Hyderabad	2020	9.7	4.8
Polymers, their Composites and Polymeric Membranes for Sustainable Development of Petroleum Industries	CSIR-NEIST, Jorhat	2020	24.7	4.9
Manufacturing of Next Generation Bio-Medical Devices	CIPET, Bhubaneswar	2020	10.0	5.0
Design and Development for Value added Toys of Rubber and Allied Finished Products	IRMRA, Thane	2022	9.8	4.9
Sustainable & Innovative Design and Manufacturing of Polymer Toys	IIT, Guwahati	2022	10.6	5.0

Source: DCPC Annual report 2023-24

Chemical Promotion and Development Scheme (CPDS)

The primary objective of the CPDS is to facilitate growth in the chemical and petrochemical industry with knowledge dissemination through studies, surveys, data banks and promotional materials. The three main components of the scheme are knowledge product creation, knowledge dissemination, and excellence awards for research and innovation.

Apart from the various schemes mentioned above, the Government of India has introduced several research entities, schemes and councils to develop skilled manpower in the industry aimed at increasing the manufacturing competitiveness of India in the global market. This effort included providing a grant-in-aid to educational institutes for setting up the CoE to improve existing petrochemical technology and promote the development of new applications of polymers. The government has also made budgetary allocations towards the Central Institute of Plastics Engineering and Technology (CIPET) to strengthen the research and development capabilities, technical infrastructure and implemented training initiatives.

Petrochemicals Research & Innovation Commendation Scheme

The Department has been administering an awards scheme aimed at incentivizing outstanding innovations within the petrochemical and downstream plastics processing sectors. To date, 11 editions of the awards have been successfully conducted.

Following recommendations from the Ministry of Home Affairs, the "National Petrochemical Awards" have been rebranded as the "Petrochemicals Research and Innovation Commendation Scheme." This revised scheme is intended to stimulate research and development within the nation, focusing on improved energy efficiency, enhanced plastic waste management, extended product lifecycles, and the creation of innovative products and quality benchmarks. The initiative is anticipated to position the Indian petrochemical industry as a competitive player on the global stage, leveraging environmentally sustainable processes and technologies.

Sources: DCPC, EY analysis

State level initiatives

In addition to the policies implemented by the Department of CPC, the incentives provided by the state governments are also critical in attracting investment in their respective regions.

MIDC has established dedicated chemical zones in various regions in Maharashtra, providing essential infrastructure and support services to the CPC industries. These zones are designed to facilitate the growth of chemical and petrochemical industries by offering ready-to-use industrial plots, common effluent treatment plants, and other necessary utilities. To streamline the approval process for new projects, Maharashtra has also implemented a single window clearance system. This system simplifies the process of obtaining various approvals and clearances required for setting up industries, thereby reducing the time and effort involved.

Tamil Nadu is developing Petrochemical Investment and Manufacturing Zones (PIMZ) to create a conducive environment for CPC industries. These zones are equipped with state-of-the-art infrastructure, including logistics facilities, utilities, and support services, to attract investments in the petrochemical sector. The state has also initiated various skill development programs to ensure a skilled workforce for the CPC sector. These programs are designed to provide training and upskilling opportunities to workers, enhancing their employability and meeting the industry's demand for skilled labor.

Below is a snapshot of the existing major incentives given by the states specific to the chemical industry.

Sources: Institute of Competitiveness, News articles, EY analysis

States	Industrial Policy Names	Category as per Investment (i.e., INR 250 crores)	Capital Incentive	Tax Incentives (Direct/ GST)	Turnover Incentives	R&D Incentives	Interest Subvention	Electricity Duty Exemption	
Gujarat	Gujarat Aatmanirbhar Scheme, 2022	Large (General & Thrust Sector)	No	80% to 100% of net SGST for 10 years up to 5% to 8% of eligible investment per annum	No	No	7% on term loan for 6 - 10 years upto 1% to 1.2% of eFCI per annum	100% Exemption for 5 years	
Maharashtra	Maharashtra Industrial Policy, 2019	Large	No	50% Gross SGST over 7 – 9 years, max up to 25% - 100% of eligible basket of investment	No	No	No	100% for 7 - 9 years (part of basket)	
Uttar Pradesh*	Uttar Pradesh Industrial Investment and Employment Promotion Policy 2022	Mega Unit (Options are given for selection of best incentives combination)	18% to 22% of eligible investment for 12 Years with annual ceiling of INR 10 Crores to INR 15 Crores	100% net SGST for 12 Years with overall ceiling of 80% to 300% of eligible investment	No	No	No	No	
Karnataka	Karnataka Industrial Policy 2020	Large	No	No	2.25% for 6 to 7 years capped at 40% - 45% of eligible investment	No	No	No	
Uttarakhand	Uttarakhand Mega Industrial and Investment Policy 2021	Ultra Mega	No	Net SGST Reimbursement @ 50% of tax liability for B2C Sales within state only. (Jubilant is in B2B sales only)	No	No	7% on term loan for 5 years maximum upto INR 50 lakhs per annum	100% for 5 years	

Source: EY analysis

	Subsidised Power Tariff	Green Power/Recycling Capital cost Subsidy	EPF/ Employment Generation/ Training based subsidy	Stamp Duty/ Land Concession Exemption	Top up on incentives received under PLI	Other Benefits
	No	No	12% of basic pay + dearness allowance & retaining allowance OR INR 1800 per month, whichever is lower	No	No	None
	No	No	No	50% - 100% Exemption (Excluding basket of incentives)	No	None
	No	No	No	50% - 100% Exemption	30% of the PLI incentives maximum upto 100% of eligible investment	Incentive for R&D Projects - 25% of expenditure, capped at INR 10 Crore Incentive for Intellectual Property RIghts Projects - 50% of expenditure incurred towards registration of patent, copyright, trademarks and Geographical Indicators, capped at INR 1 Crore
	No	50% of cost, capped at INR 2.50 crore & INR 5 crores for setting up common ETP	No	75% - 100% Stamp Duty Exemption	No	Concessional Registration Charges of INR 1 per INR 1000/- Reimbursement of Land conversion fees @ 100%
	INR 1 per unit for 5 years maximum upto INR 1 crores per annum	30% subsidy capped at INR 50 Lakh - for ETP plant Set up	INR 500 (Male) to 700 (Female) per employee monthly for the 5 years on the employees in excess to 200 employees	50% Reimbursment of Stamp Duty	No	- Rebate on land rates @30% of prevailing rates of SIIDCUL - Concessional Registration Charges of INR 999 per INR 1000/-

Source: EY analysis

States	Industrial Policy Names	Category as per Investment (i.e., INR 250 crores)	Capital Incentive	Tax Incentives (Direct/ GST)	Turnover Incentives	R&D Incen-tives	Interest Subvention	Electricity Duty Exemption	
Goa	Goa Industrial Policy 2022	No Classification	No quantified benefits noted						
Madhya Pradesh	Industrial Promotional Policy, 2014 (Amended as of October 2019)	Mega	10% -40% of Eligible investment up to maximum INR 150 crores	No	No	No	No	No	
Tamil Nadu*	Tamil Nadu Industrial Policy, 2021	Sub Large	- Fixed Capital 5% of eligible investment -Back end capital subsidy maximum upto INR 1 crore	No	No	No	No	100% for 5 years	
Kerala	Kerala Industrial Policy 2023	Large (Only Pharma is in Priority Sector)	10% on eligible investment maximum upto INR 10 crores	100% Net SGST reimbursement on eligible investments for 5 years	No	20% of R&D cost maximum upto INR 1 crore	No	No	
Telangana	Telangana State Industrial Development and Entrepreneur Advancement (T-IDEA) Incentive Scheme 2014	Mega (customized benefits are available) - Incentives as per Large units	No	50% Net SGST reimbursement upto 7 years maximum upto 100% of eligible investments.	No	No	No	No	

Source: EY analysis

	Subsidised Power Tariff	Green Power/Recycling Capital cost Subsidy	EPF/ Employment Generation/ Training based subsidy	Stamp Duty/ Land Concession Exemption	Top up on incentives received under PLI	Other Benefits
	INR 1 per unit for 5 years (Available to Food processing units)	50% up to a maximum of INR 1 crore	No	No	No	None
	No	25% up to a maximum upto INR 1 crore	No	50% exemption on lease or purchase of land/shed/buildings meant for industrial use in parks promoted by SIPCOT/SIDCO	No	None
	No	Reimbursement of 25% of cost maximum upto INR 25 Lakh	25% of monthly wages of each additional local employment created over & above 50%, maximum upto INR 5000/- per month per person	No	No	-Quality Certification - 50% of expenses incurred maximum upto INR 25 Lakh per unit per annum - Intellectual Property creation incentives - 50% reimbursement of expenditure, maximum upto INR 30 Lakh - IR 4.0 Initiatives in Manufacturing - 20% reimbursement of expenditure, maximum upto INR 25 Lakh/unit.
	INR 1 per unit for 5 years from DoCP	25% of cost maximum upto INR 5 Lakhs	50% of actual training cost maximum upto INR 2,000 per local person	100% reimbursement of stamp duty	No	Capital Subsidy for Infrastructure facilities from IIDF - 50% of cost maximum upto INR 1 Crore

Source: EY analysis

States	Industrial Policy Names	Category as per Investment (i.e., INR 250 crores)	Capital Incentive	Tax Incentives (Direct/ GST)	Turnover Incentives	R&D Incentives	Interest Subvention	Electricity Duty Exemption	
Rajasthan*	Rajasthan Investment Promotion Scheme 2022	Large	13% to 20% of Eligible Fixed Capital Investment for 10 years with ceiling of - - INR 50 crores (year 1-3) -INR 65 Crores (year 4-7) - INR 80 crores (year 8-10)	75% of SGST reimbursement for 7 years with Annual ceiling - INR 50 crores (year 1-3) -INR 65 Crores (year 4-7)	1.2% to 1.65% of net sales turnover for 10 years with annual cap of - - INR 50 crores (year 1-3) -INR 65 Crores (year 4-7) - INR 80 crores (year 8-10)	No	5% on term loan for 5 years (maximum upto 2.5% of eligible investment per annum) - Only for Thrust Sectors	100% for 7 years	
Andhra Pradesh	Andhra Pradesh Industrial development Policy 2023-27	Large	No	100% Net SGST for 5 years up to 50% to 100% of eligible investment (Excluding land)	No	No	No	No	
Punjab	Industrial and Business Development Policy, 2022	Anchor Unit	No	100% Net SGST for 15 years, maximum upto 200% of eligible investment	No	No	No	100% for 15 years up to 100% of eligible investment	

Source: EY analysis

	Subsidised Power Tariff	Green Power/Recycling Capital cost Subsidy	EPF/ Employment Generation/ Training based subsidy	Stamp Duty/ Land Concession Exemption	Top up on incentives received under PLI	Other Benefits
	No	Environmental Infrastructure Facilities - 50% up to a maximum of INR 10 crore Zero Liquid Discharge & Air Pollution control (per line item) - 50% of equipment capped at INR 1 crore Water Measures - 50% or INR 10 lakhs Energy Efficiency Measures - 50% consent fee waiver Air Pollution Control Measures - One-time capital subsidy up to 50% of the cost of projects subject to a ceiling of Rs. 1 cr. per project	INR 4,000 per worker per month for 6 months. Employment Booster are also given for entities creating extra employment	100% exemption	No	Cluster: Eligible for standard package Freight: INR 10,000 / INR 20,000 for 20 feet /40 feet per container or 25% of total freight expenses (whichever is less) Coversion Fees - 100% benefit given in stages as notified by the State Mandi Exemption - 100% exemption for 7 years Land Tax Exemption - 100% exemption for 7 years
	No	No	No	No	No	Piped Water Supply at pre-revised tariff rate
	No	No	INR 36,000 per employee and INR 48,000 for women and SC/OBC/BC employee for 5 years	100% exemption / remibursement	No	Exemption from CLU Charges - 100% exemption Exemption from the condition of the license issued by PAMB from payment of 2% over and above the MSP, for permission given under Direct Purchase.

Source: EY analysis

States	Industrial Policy Names	Category as per Investment (i.e., INR 250 crores)	Capital Incentive	Tax Incentives (Direct/ GST)	Turnover Incentives	**R&D Incen-tives**	Interest Subvention	Electricity Duty Exemption	
West Bengal	West Bengal State Support For Industries Scheme, 2013	No Classification	Policy is not updated						
Himachal Pradesh	Himachal Pradesh Industrial Investment Policy, 2019	Large	No	60-80% Net SGST for 7 years, maximum up to 100% of eligible investment	No	No	3% on term loan maximum up to INR 10-20 Lakhs per annum for 3 years	5% - 7% concessional rate of electricity duty for 5 years	

Source: EY analysis

	Subsidised Power Tariff	Green Power/Recycling Capital cost Subsidy	EPF/ Employment Generation/ Training based subsidy	Stamp Duty/ Land Concession Exemption	Top up on incentives received under PLI	Other Benefits
	Concession by 15% on electricity charges for 3 years	No	Incentives to encourage employment of bonafide himachali @ 1000 per month from DoCP for 10 years for additional employment generated over and above 50 Bonafide Himachlies	- 20% - 50% Stamp Duty exemption - Concessional rate allotment at 25% to 65%	No	Transport Subsidy - actual or INR 20/30 lakhs whichever is lower for a period of 3/5 years Concession on Registration fees - 20% to 50% Assistance for Patent Filing - Reimbursement of Rs.10 lakhs or 75% of expenditure incurred/charges paid to patent attorney, patent service centre and patent filling agency for obtaining patent, whichever is lower Assistance for use of green fuel - Reimbursement of 50% of cost incurred within the factory premises to fuel manufacturing process with gas/ solar power or to use it as an alternate power backup, subject to maximum of Rs.3 lakhs per enterprise. Assistance for use of green fuel - Reimbursement of 50% of cost incurred within the factory premises to fuel manufacturing process with gas/ solar power or to use it as an alternate power backup, subject to maximum of Rs.3 lakhs per enterprise. Concessional Rate of Allotment of Land - 25% to 65% depending upon location Easy Payment schedule of land premium - 15% before handover of land and balance in 5 equal interest free installment Provisions of extension in provisional allotment period- 3 years and can be extended upto 5 years Provision to rent out surplus built up area for industrial use - rent out upto 60% of built up area, Exemption from payment of Change in Land Use charges - Enterprise setting up in B & C location exempted from payment of change in land use.

Source: EY analysis

States	Industrial Policy Names	Category as per Investment (i.e., INR 250 crores)	Capital Incentive	Tax Incentives (Direct/ GST)	Turnover Incentives	**R&D Incen-tives**	Interest Subvention	Electricity Duty Exemption	
Odisha	Odisha Industrial Policy Resolution, 2022	Large (Priority and Thrust Sector)	20% - 30% subsidy for Investment in Plant & Machinery for 5 years	100% net SGST, maximum upto 200% of investment in Plant & Machinery	No	No (not relevant for Jubilant's business)	No	100% exemption of electricity duty for 7-10 years from DoCP	
Haryana	Haryana Enterprises and Employment Policy, 2020	Mega (Thrust Sector Incentives)	No	50-% to 100% of Net SGST for 7 to 10 years maximum upto 100% - 150% of eligible investment.	No	No	No	100% exemption of electricity duty for 10-20 years	
Bihar	Industrial Investment Promotion Policy, 2016	Mega	No	80% net SGST maximum upto 70-100% of eligible investment	No	No	10% or actual rate maximum up to INR 10 crores subject to 15-30% of project cost	100% exemption of electricity duty for 5 years	

Source: EY analysis

	Subsidised Power Tariff	Green Power/Recycling Capital cost Subsidy	EPF/ Employment Generation/ Training based subsidy	Stamp Duty/ Land Concession Exemption	Top up on incentives received under PLI	Other Benefits
	Reimbursement of tariff of INR 2 per unit for 7-10 years from DoCP	25% of cost maximum upto INR 10 crores (per Infrastructure namely ETPs)	100% EPF Reimbursement for 5-7 years	100% exemption	No	Land concession - Concessional rate subject to certain conditions, Incentive for ZLD - 50% of capital subsidy on cost of relevant equipment up to a maximum of Rs.10 crore per industrial unit.
	No	No	- INR 30,000 per employee - INR 36,000 for women and SC/OBC/BC employee for 7 years (general sector) and 10 years (thrust)	80-100%	No	External Development charges 60-100% exemption
	No	No	No	-100% reimbursement	No	- Exemption from CLU Charges Land conversion fees - 100% reimbursement

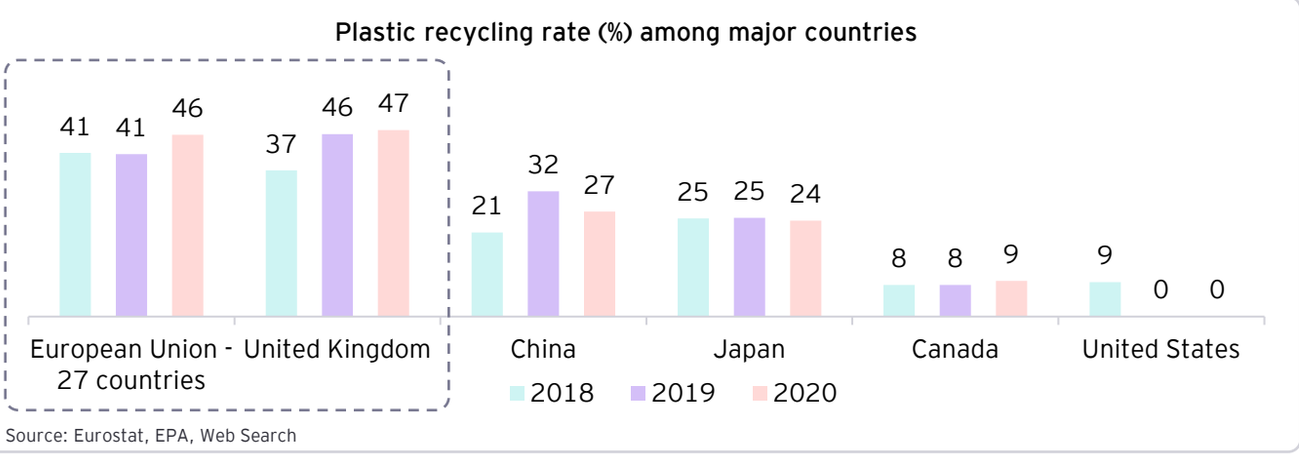
Source: EY analysis

5

Benchmarking global best practices

EU's Circular Economy

EU is at the forefront of the global transition towards a circular economy with the highest plastic recycling rates as of 2020.



Source: Eurostat, EPA, Web Search

>40% average plastic recycling rates for four EU countries in 2020 were: Netherlands (45%), Norway (44%), Spain (43%) and Germany (42%).[22]

5%-6% plastic recycling rates in the US significantly declined in 2021 compared to 2018, due to China's waste import bans.[23]

The passage of the EU's Green Deal and Circular Economy Action Plan in 2020 signaled a much more ambitious approach to sustainability, with economy-wide objectives for greenhouse gas reduction, nature restoration and resource use, among many others. This policy package also included regulations on Ecodesign for Sustainable Products (ESPR), battery recycling and single-use plastics, among others.

Sources: Eurostat, EPA, News articles, EY Analysis

How the ESRS contemplates circular economy principles

The European Sustainability Reporting Standards (ESRS) specifically address circular economy practices through ESRS E5 Resource use and circular economy. This standard is a key component in driving the adoption of circular economy principles, as it requires entities to disclose their impact on resource use, including both positive and negative effects, and how they align with circular economy principles. Entities must conduct a double materiality assessment to determine the relevance of a circular economy and resource use to their operations. If deemed material, they must report on their circular economy-related risks, opportunities, and impacts, including policies, actions, and targets aimed at promoting circularity, such as circular design, material use rates, and waste management strategies.

The CSRD mandates a transformative approach to how companies view their value chain, emphasizing the social, environmental, and economic impacts of resource flows. Entities are required to disclose detailed information on resource inflows and outflows, including the use of biological and technical materials, recycled content, and waste generated. Additionally, they must outline their waste management strategies and the extent of product recirculation and recycling. The anticipated financial effects of these circular economy practices, including both quantitative and qualitative aspects, will also need to be reported. This comprehensive approach to reporting aims to foster a more sustainable and circular approach to business operations.[24]

Initiatives by the Indian government to support plastic recycling and circular economy

The Indian government has also undertaken multitudes of initiatives to support a circular economy under its waste management rules (2016) on plastic, electronic, solid and hazardous wastes

- The Extended Producer Responsibility (EPR) mandates for the collection, storage, transportation, treatment, and proper disposal or recycling of end-of-life e-waste.
- Increase in the minimum thickness of plastic bags to dis-incentivize free distribution by retailers.
- Prohibition and fines for producing non-recyclable or non-energy recoverable multi-layer plastic packaging, with no alternative use.
- Introduction of a plastic waste management fee for producers, importers, and vendors through a pre-registration process.
- Requirement for source segregation of waste to enhance value recovery and encourage the recycling and reuse of materials.
- Industrial estates, SEZs, and industrial parks must allocate at least 5% of their area for waste recovery and recycling facilities.
- Focus on the recovery and reuse of materials from hazardous and other wastes, ensuring their proper management.
- Reduction of GST rates from 28% to 5% on electronic waste and from 18% to 5% on plastic, glass, and rubber waste to promote recycling.[15]

Sustainability reporting in India

The GoI is enabling a regulatory environment to promote sustainability led by regulators, including the Securities and Exchange Board of India (SEBI) and the Reserve Bank of India (RBI), paving the way for improved ESG-related disclosures and sustainable finance.

- RBI issued detailed guidelines for acceptance of 'green deposits' by banks and NBFCs wherein the funds could be used for financing activities such as renewable energy, green transport/buildings.
- In 2022, the Sovereign Green Bond (SGB) framework was implemented to deploy proceeds in public sector projects which help in reducing the emissions intensity of the economy
- SEBI has advanced corporate sustainability through the new Business Responsibility and Sustainability Report (BRSR) framework. This integrates elements from global standards such as GRI, SASB, TCFD, and IR. Additionally, SEBI has introduced "BRSR Core," requiring external assurance on a set of 50 key indicators during the annual reporting cycle.

Sources: EU regulations for CE – EY, GCPMH 2023, News Articles, EY Analysis

Benchmarking the US IRA and EU Green deal

Considering the increasing number of sustainability regulations, the US IRA and the EU Green Deal are committed to reshaping their respective economies. Even though the EU has made concrete efforts, their incentives struggle to match the influence and attractiveness of the IRA for the chemical industry. While subsidies are not likely to impact ongoing investments in EU, they may shift the invest landscape favouring US over EU.

	US IRA	EU Green Deal
Overview	Designed to mobilize private capital to lower energy costs, and reduce carbon emissions by **~40%** by 2030	The aim of the Green Deal is for the EU to become the world's first **"climate-neutral bloc"** by 2050
Incentive	Simple tax credits and incentives structure scheme with the tax incentive valid for **10 years**	Comprehensive list of sustainable incentive programs with a range of support to green initiatives
Process complexity	**Simplified** approval process for incentives with minimal regulations especially for green energy/EVs	Highly **regulated** and lengthy application process with limited total funding volumes.
Areas of concern	Lack of carbon emissions penalty and focus is on internal market and industrial development only	**Lack** of uniform tax credit/tax incentive program and approval dependency on member states
Opportunity for market growth	Potential for **increased market share** in the US and exports to European markets for commodities such as polysilicon, NMC cathodes	**Reduce dependency** on foreign competitors for the supply of energy sources by accelerating funds for renewable energy
Instruments of funding	The IRA explicitly focuses on **tax incentives** in the form of transferable tax credits (TTCs) through the extension of numerous energy-related federal income tax credits	The EU Green Deal relies on **non-tax incentives,** that includes the EU funds, national funds, EU's Covid-specific NextGen Fund
Key focus areas of chemicals	The Act targets decarbonization, emphasizing **hydrogen** The IRA offers **tax credits** for low-carbon hydrogen production, capped at US$3/kg It covers carbon sequestration, EVs, and fuel cells There are no direct measures for circular plastics	Act promotes safe, **sustainable chemical innovation** Green Deal lacks structured **hydrogen plan;** proposes funding via auctions EU Green Deal suggests new rules for **packaging** to reduce plastic waste and boost recycled plastic use
Initiatives for chemical industry	**US$6 billion in grants** and tax credits for company decarbonization **Methane fee** introduced to cut chemical industry emissions	Aims to boost investment for chemical production with **sustainable lifecycle** Promote the EU's supply and sustainability of **critical chemicals**

Sources: DCPC, EY analysis

Best practices and projects in ASEAN Countries

Jurong Island, Singapore

Jurong Island is the 3,000-hectare nucleus of Singapore's Energy and Chemicals sector, hosting over 100 global companies in refining, olefins production, and chemical manufacturing. The Island has emerged as a significant hub in the CPC production sector, catalysing over S$50 billion in investments for the past 30 years. The strategic land reclamation initiative, which merged seven islands at a cost of S$7 billion, has been pivotal in fostering this industrial cluster. Today, Jurong Island is instrumental in generating a third of Singapore's manufacturing output. However, the island's competitive edge is facing challenges, underscored by Shell's divestment efforts and the cancellation of key sustainable projects. These developments signal a potential shift in the island's industry dynamics, particularly as companies navigate the net zero transition.

Singapore is now transforming Jurong Island into a sustainable energy and chemicals park to meet its 2030 emission targets. The Singapore Chemical Industry Council (SCIC) Chairman announced collaborative initiatives to quadruple the production of sustainable goods from 2019 levels and cut over six million tonnes of carbon annually, aiming for net zero emissions by 2050. The government's commitment includes a S$5 billion (US$3.7 billion) Future Energy Fund to foster the transition to cleaner energy, as part of the national 2024 budget.[26]

Focus areas of recent projects in Singapore[27]

Traditional chemicals manufacturing and R&D

- **ExxonMobil** has undertaken a multi-billion-dollar expansion of its largest refinery on the island to produce higher-value lubricant base stocks and distillates from fuel oil and other crude products.
- **IFF** broke ground with one of its largest Innovation Centers, located at Biopolis, an R&D life science cluster.

Low-carbon and circular solutions

- **Neste** has invested EUR1.6 billion to double its biorefinery output, enhancing the global production of sustainable aviation fuel (SAF) and renewable polymer feedstock. The company also established its inaugural R&D center outside Finland in Singapore.

Supply chain

- **Maersk** to invest US$500 million in Southeast Asia, including a distribution mega-hub called World Gateway 2 in Singapore
- Goodrich Maritime also moved the operating base for their tank business from Dubai to Singapore

Sources: EDB, GB Reports, News Articles, EY analysis

Johor-Singapore Special Economic Zone (JS-SEZ)[27]

In 2023, Malaysia and Singapore's trade reached US$80 billion, with Singapore contributing RM43.7 billion or 13.3% of Malaysia's total approved investments. The strategic proximity of Johor to Singapore, coupled with robust people-to-people connections, exemplified by over 300,000 daily commuters, underpins one of the world's most active land borders. Recognizing the potential for enhanced economic collaboration, the leaders of both nations have endorsed the Johor-Singapore Special Economic Zone (JS-SEZ) through a Memorandum of Understanding, aiming to further solidify their economic partnership. The MOU was signed on 11 January 2024. Singapore and Malaysia are also exploring other initiatives leading up to the SEZ, including a passport-free clearance system on both sides of the border.

The RAPID (Refinery and Petrochemicals Integrated Development) project within Malaysia's Pengerang Integrated Complex (PIC), a US$20 billion investment, aims to advance the country's specialty chemicals sector. Located in Johor, close to Singapore and 400 km from Kuala Lumpur, the complex is a joint venture between Petronas and Saudi Aramco, operated by PrefChem. Despite its completion in 2018, the facility faced setbacks, including a fatal fire in 2020 that halted polymer production. Operations resumed in 2022, though there have been intermittent maintenance stops. As the region's largest complex, it houses a 300,000-bpd refinery, a naphtha cracker with a 3.3 MMTPA output of propylene and olefins, and a polymer complex producing Polypropylene (PP), Linear Low-Density Polyethylene (LLDPE), High Density Polyethylene (HDPE), as well as glycols complex for monoethylene glycol (MEG) and diethylene glycol (DEG).

Malaysia's Chemical Industry Roadmap 2030[27]

Malaysia's Minister of International Trade and Industry in August 2023 unveiled the Chemical Industry Roadmap 2030 (CIR2030), a collaborative effort with key industry players and the nation's first dedicated chemical industry plan. The CIR2030 seeks to position Malaysia as a top chemical hub in the Asia Pacific by enhancing value-added production, industry integration, and sustainability practices. The chemical sector, which represents 6% of Malaysia's GDP and employs about 293,000 people, is expected to see its Gross Value Add (GVA) grow by over 4.5% by 2030, contributing an additional RM40 billion in value. The roadmap focuses on three key segments: base chemicals and intermediaries, plastics and polymers, and specialty chemicals.

CIR 2030 marks a major step forward in developing a vibrant, sustainable, and innovative chemical industry in Malaysia. Its goals are to upgrade the industry's value chain, improve integration, increase competitiveness, and move towards carbon neutrality by leveraging advanced technology. At the heart of this strategy are 11 critical focus areas across base chemicals, plastics, polymers, and specialty chemicals, aimed at establishing Malaysia as a premier chemical hub in the Asia-Pacific region.

Sources: EDB, GB Reports, News Articles, EY analysis

6

Global trends and opportunities

Shift towards sustainable practices

Decarbonization: emerging as a priority commitment

More than three-fourth of the chemical industry's emission are Scope 3, the industry significantly lags its peers in setting emission reduction targets. Consequently, decarbonization has emerged as a primary focus for chemical companies, emphasizing electrification, carbon capture, utilization, and storage (CCUS), alternative energy, technological advancements, and addressing Scope 3 emissions as key areas. Given that Scope 3 emissions constitute the largest share, tackling them is imperative.

Current situation:

- Increasing chemical organizations' commitment to achieving net zero greenhouse gas (GHG) emissions by 2050
- However, the chemical industry lags peers in emission reduction targets, especially Scope 3
- Many chemical firms count only some Scope 3 categories against their sustainability goals—and a few don't publicly track Scope 3 at all

Way forward 2023 and beyond:

- With increasing regulations such as EU CSRD and carbon pricing mechanisms, the norm in the chemical industry is moving from measuring and reporting Scope 3 emissions to making detailed plans and setting public goals to reduce them.

Sources: Press releases, World economic forum, The manufacturer, EY Analysis

76% of the top 100 chemical companies have committed to carbon neutral or net zero goals by 2050, and 88% have set interim reductions for 2030

Source: Chemweek Survey 2022

Average emission reduction target for 2030*

~43%	VS	~47%
Chemical sector		Across all major sectors

No. of companies that have set a Scope 3 emission reduction target for 2030*

<50%	VS	~75%
in chemicals		telecom sector

Source: Energy Monito; SBTir

Digital technologies enabling sustainability[25]

The chemical industry is focussing on prominent areas for sustainability where digital technologies are expected to bring maximum impact. Key sustainability-focused objectives within the chemical sector poised for significant digital technology-driven advancements.

Sustainable product design/ development

- Exploration of product structure-property relationships, sustainability, and improved performance via product lifecycle management (PLM)
- AI/ML and quantum computing advance automated simulations, speeding up design and replacing hazardous materials

01 → Archroma's One Way Impact Calculator tool estimates process costs, resource usage, effluent quality, and CO_2 emissions for customers thereby facilitating sustainable recipe reformulations

Sustainability assessment

- Calculation/monitoring/transparency of Scope 1,2 and 3 emissions and life cycle assessment (LCA)
- Tools enhancing data availability for ecosystems and aiding sustainable product design through toxicity assessment

02 → LANXESS has developed a software (Product Carbon Footprint Engine) that automatically calculates the carbon footprint for each of the company's product

Enabling materials and chemical circularity

- Track and trace capabilities for the entire life cycle of the product
- Use of blockchain and digital product passports

03 → BASF Canada is using resiChain, a blockchain enabled platform which aims to bring together plastic value chain players to enable circularity, tracking and sorting of recycled plastic

Green and circular process design/production

- Process design and optimization, resource and energy efficient production using digital Twin/ IoT, renewable energy and alternative feedstock integration

04 → Genomatica has developed plant-based, lower-carbon (50% reduction) palm oil alternatives on its synthetic biology platform

Logistics and distribution

- Secure and accurate data sharing to reduce operational costs, increase efficiency of resources, and foster modal shifts; technologies such as AI could be leveraged for predictive analytics

05 → Linde leveraged AI to predict accidents by analysing 10 years of driving data and recommended actions for avoidance, route optimization and fuel-efficient driving

Sources: Company website, Press releases, EY analysis

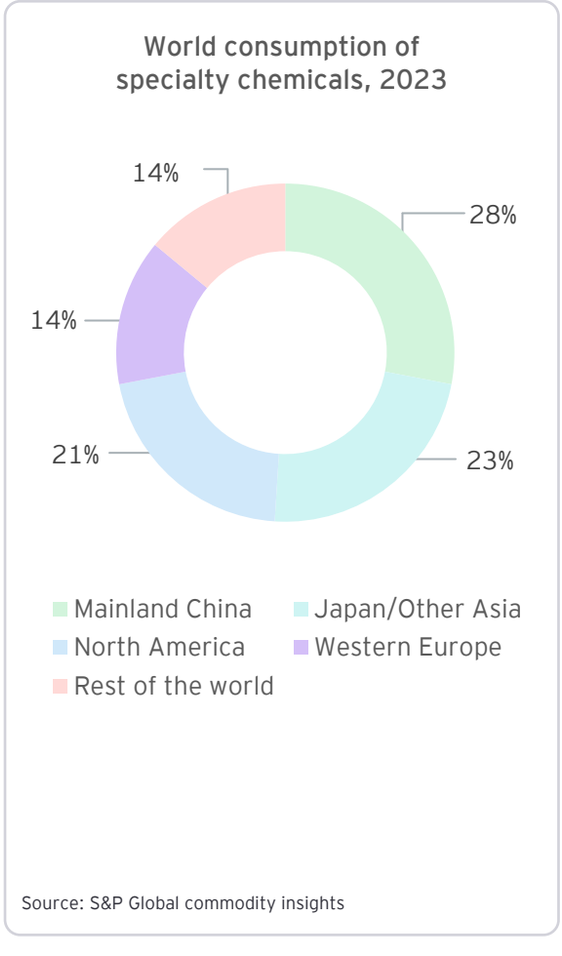
Rising demand for specialty chemicals set to fuel growth of the industry

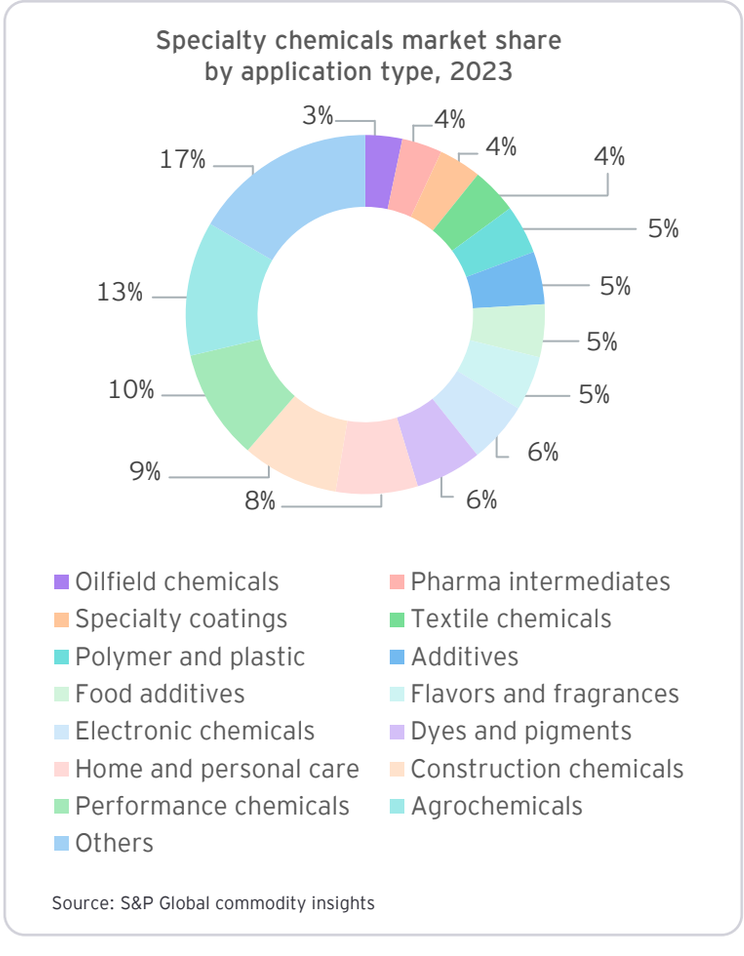
The global specialty chemicals sector is projected to experience a compound annual growth rate (CAGR) of 3.0% in volume from 2024 to 2029, rebounding from a 1.6% market value contraction in 2023.[28] The specialty chemicals market in India was valued at US$33.5 billion in 2023 and is expected to reach US$61.5 billion by 2029, growing at a CAGR of 10.7% during the forecast period.[29] Growth trajectories will differ across segments, with electronic sector chemicals, including semiconductors and IC process chemicals, poised for robust expansion due to surging demand for electronic devices such as smartphones and wearables.

Conversely, sectors such as emission-control catalysts and lubricating oil additives are anticipated to witness stagnant or declining growth amid the energy sector's shift away from fossil fuels. The diminishing role of internal combustion engines and the rise of EVs and renewable energy sources will reduce the need for these products. Sustainability and digitalization are key forces reshaping the industry. Firms are channeling investments into eco-friendly specialty chemicals in response to regulatory mandates and consumer preferences for sustainable products. Industry 4.0's digital transformation is streamlining operations and catalyzing demand for electronic chemicals and advanced polymers.

Despite these opportunities, the industry must navigate raw material supply challenges and price volatility, necessitating agile sourcing and robust supplier networks. Global players are enhancing local market capabilities through strategic joint ventures, mergers, and acquisitions, while innovation remains critical, focusing on high-performance and multifunctional chemicals for sectors such as renewable energy and EVs.

Asia is increasingly becoming the focal point of the industry, with Chinese and Indian manufacturers becoming prominent in several markets. China is evolving from a low-cost producer to one that satisfies domestic demand for high-value products. Meanwhile, North American, European, and Japanese producers are expanding into developing regions to tap into new growth opportunities. Continuous innovation is essential to stay competitive as the market landscape intensifies and mature products become commoditized.





Sources: IHS Chemweek, EY analysis

Push for bioplastics and biodegradables accelerates

Chemical firms are increasingly innovating with renewable plastics to mitigate carbon emissions and address plastic pollution. Biodegradable bioplastics such as polylactic acid (PLA) and polyhydroxyalkanoates (PHA) are being developed to combat marine and terrestrial plastic waste. In China, the production of renewable butanediol (BDO) is on the rise, used for creating biodegradable plastics. Plant-derived traditional plastics are contributing to carbon sequestration, enabling businesses to lower their carbon footprint.

Focus on PLA/PHA has been growing[30]

PLA has carved out a specialized role in the 3D printing industry due to its low melting point and user-friendliness. More recently, PLA's application has broadened to include single-use items such as cups, utensils, coffee pods, and packaging, favored for its compostability.

Total Corbion PLA is in the process of constructing a facility in France, while NatureWorks is underway with a PLA production site in Thailand. Futerro has recently finished building its inaugural PLA factory in China and is contemplating a second in France. Additionally, Levima Advanced Materials and Henan Jindan Lactic Acid Technology are each erecting PLA production plants in China. In the US, LG Chem and Archer Daniels Midland (ADM) are investigating the production of lactic acid for use in food and pharmaceuticals, as well as for PLA manufacturing.

Interest in PHA has surged as well due to its biodegradable properties. CheilJedang has commenced production of this bioplastic at its Pasuruan facility in Indonesia, launching PHACT, a PHA variant marketed for its marine biodegradability.

In the US, Danimer Scientific is manufacturing its Nodax PHA brand at a site in Winchester, Kentucky, with an expected output of 32.5 million pounds per year. It also acquired Novomer, which developed a PHA type called poly(3-hydroxypropionate) (p(3HP)), branded as Rinnovo. While commissioning for a demonstration Rinnovo plant has begun, the company has paused the development of a pilot plant in Rochester, New York, due to its early construction phase. Additionally, biotech company RWDC Industries and Lummus have agreed to collaborate on PHA projects, with RWDC branding its PHA as Solon.

Bioplastic intermediates through sugar fermentation[30]

Novamont initiated the commercial production of 1,4-butanediol (BDO) through sugar fermentation in Italy back in 2016, leveraging technology developed by Geno, previously known as Genomatica. This technology is also central to a new facility under construction in Iowa by Qore, a collaboration between Helm and Cargill. BDO serves as a precursor for manufacturing polyurethanes and various biodegradable polymers, including polybutylene adipate terephthalate (PBAT), poly (butylene succinate-co-terephthalate) (PBST), and polybutylene succinate (PBS), as well as polybutylene terephthalate (PBT), a polyester utilized in electronics and automotive industries.

Furthermore, Geno, in partnership with Aquafil, has innovated a method to produce nylon 6 from caprolactam, which is derived from fermented sugar. Their joint efforts led to the creation of a large demonstration plant in Slovenia in 2020, aimed at generating renewable nylon 6, now featured in lululemon's latest product offerings. Geno has emphasized that this renewable nylon does not compromise on quality or performance. The Slovenia plant will continue to meet product demands until larger-scale production facilities become operational. Additionally, Ginkgo Bioworks and Visolis are enhancing a microbial strain to produce an intermediate for isoprene and sustainable aviation fuels (SAF), further contributing to the advancement of bioplastics and sustainable materials.

Sources: ICIS, News articles, EY analysis

7

Making Indian global champions

Enablers for India in manufacturing and GVC integration

India emerging as an attractive manufacturing hub

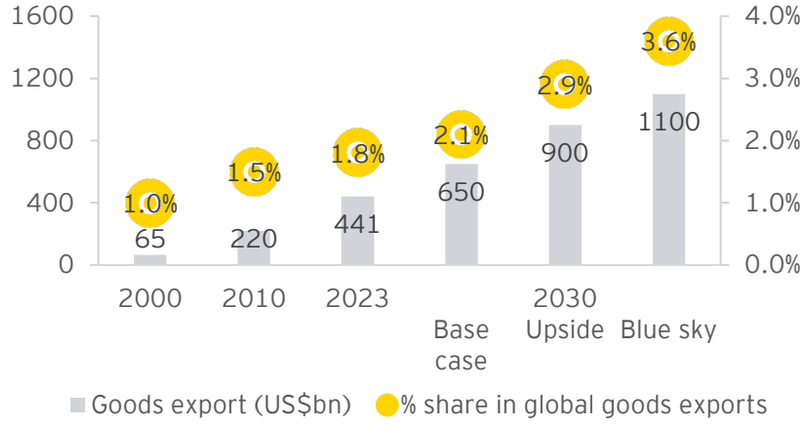
India has the potential to become a beneficiary of the China+1 strategy over the medium to long term. Manufacturing wages in India remain some of the lowest in Asia. Moreover, policymakers in India have taken considerable steps to enhance the nation's business climate in recent years. This includes reducing the corporate tax rate and implementing various policy initiatives, such as the PLI scheme and reforms aimed at stimulating manufacturing. On the downside, India is disadvantaged by higher logistics costs, low labor productivity and regulatory impediments.

Among the Asian countries, India and Vietnam stand out as attractive destinations for shifting supply chains. Malaysia may further develop its incumbent advantage in the electronics supply chain, while Indonesia and Thailand could make inroads into the EV supply chain.

Foreign investors seem to be voting with ample confidence in India. Foreign institutional investment (FII) flows into India's equity market since 2019 amounted to US$50 billion. As per NSE ownership tracker, FII ownership in Nifty 50 companies was 19% as of March 2024.[31]

India looks like an attractive destination compared to China and Vietnam due to its demographics, ease of doing business, and labor cost advantage

India's potential market share in global goods exports scenario



Sources: UBS, NSE, News articles, EY Analysis

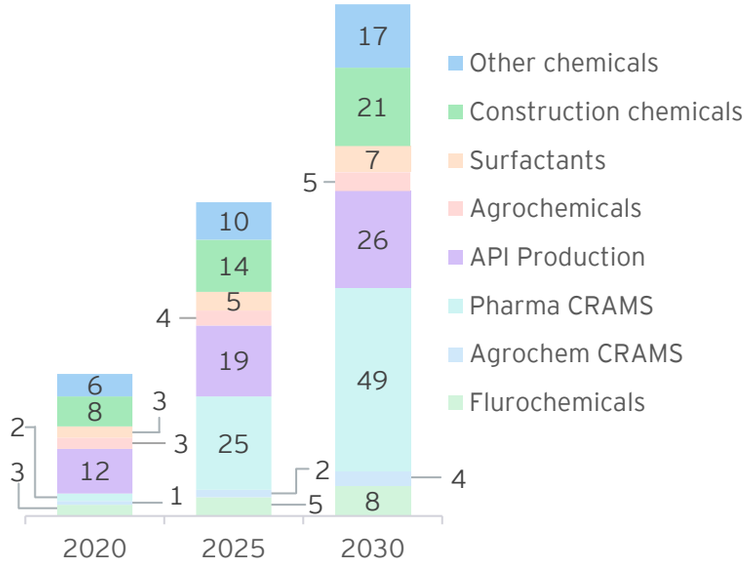
Source: ITC Trademap, UBS estimates, Note: Base case = India's market share in global exports proportional to historic average; upside scenario = exports improve by nearly 100bps between 2023 and 2030; blue-sky scenario = market share in global exports doubles from 2023 to 2030

Sectors driving the demand of CPC

An influx of domestic demand from both linked industries and direct consumers is significantly driving the demand for CPC in India. The market size of connected industries is expected to see substantial growth, with textiles and apparel projected to grow at a 10% CAGR to reach US$350 billion by 2030, the automotive sector growing from US$222 billion to US$300 billion by 2026, and the construction industry expected to hit US$1.4 trillion by 2025.[32]

The specialty chemicals market is expected to grow strongly and register a double-digit CAGR till 2026. Rise in demand in end-user industries (because of increasing population and urbanization), along with increased investments in infrastructure development, is facilitating the growth of key segments such as construction, batteries, and pharmaceuticals. Hence, Specialty chemicals is expected to drive demand with multiple drivers supporting the macro environment.

Addressable opportunity for Indian specialty chemicals, (in US$ billion)



- Textiles: US$1.4 billion PLI
  Batteries: $2.4b PLI
- Smart City Mission: 100 cities
  Provident Housing: $0.5b
- Pandemic induced tailwinds drive higher spends on wellness
- Healthy agrochemical pipeline amidst rising cropping intensity
- Bulk Drugs: $0.9b PLI
  Pharma Mfg.: $2b PLI
  3 Bulk Drug Parks: $0.5b
- Global Pharma CRAMS opportunity grows at 6%-7% CAGR over 2030
- Crop protection market and agrochemical CRAMS opportunity growth at 5%-6% CAGR over 2030
- White goods: $0.5b PLI

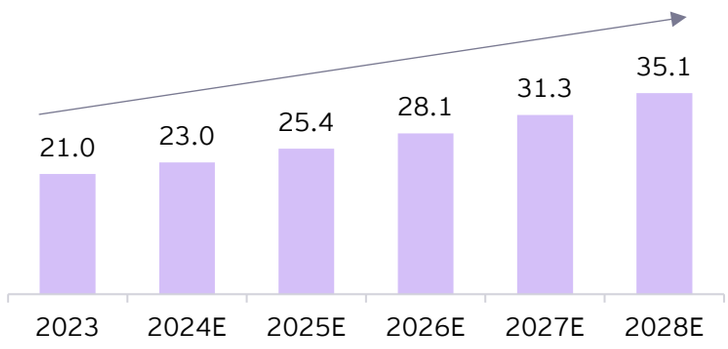
Source: Morgan Stanley Research

Sources: Morgan Stanley, EY analysis

CRAMS opportunity in India

CRAMS have traditionally been a stronghold of the pharmaceutical sector, with subsequent adoption by the agrochemical industry, as evidenced by companies such as PI Industries and SRF. Over recent decades, Indian chemical firms have refined their synthetic capabilities, positioning themselves as key players in this lucrative and rapidly expanding market. Leading Indian chemical entities such as Deccan Chemicals, PI Industries, SRF, Navin Fluorine, and Anupam Rasayan have established a track record of serving an international client base for over 10 years. Their sustained growth in the CRAMS sector can be attributed to the successful delivery of projects, process enhancements, cost efficiency, and robust intellectual property safeguards, resulting in recurring business and an increase in project opportunities.

The evolving perception of multinational corporations regarding Indian chemical companies is anticipated to further propel the CRAMS industry. The Indian CRAMS market was valued at US$21 billion in 2023 and is expected to grow to US$35.1 billion in 2028, with a CAGR of 10.8%.[33]

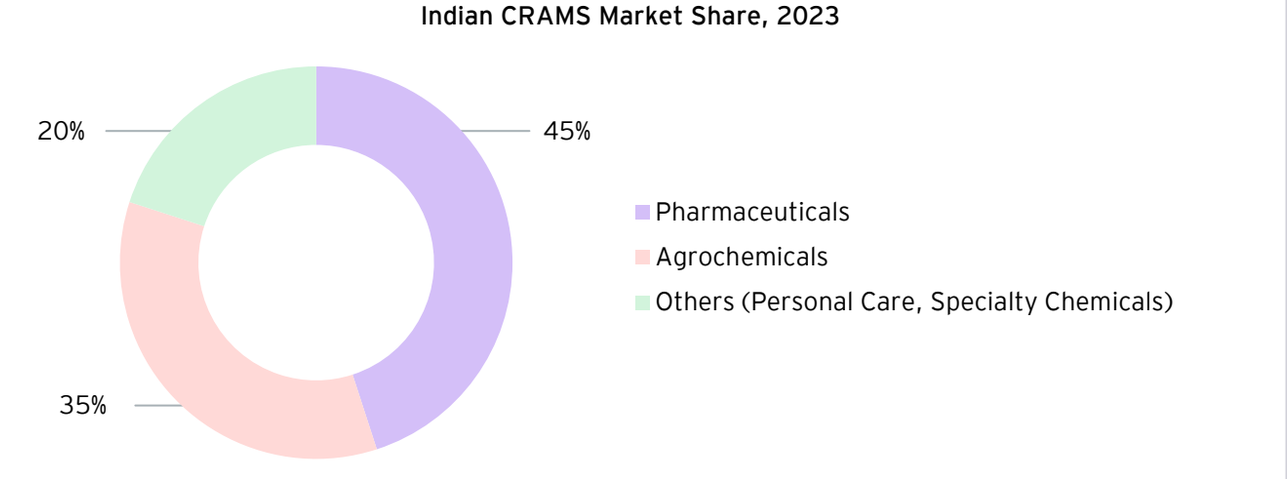


Source: Technavio Research

Key drivers:

- Lower capex costs
- Widespread talent pool
- 300+ USFDA approved mfg. facilities
- IP protection
- Long-term relationships with customers
- Drugs/ agrochemical going off-patent

The Indian CRAMS landscape is skewed towards the pharmaceutical sector, which represents over 45% of the total market, with agrochemicals holding a substantial 35% share.[34] Historically, pharmaceutical firms have led the pharma CRAMS niche, while chemical companies have primarily served the agrochemical sector. However, leveraging their robust synthesis expertise, chemical enterprises are now increasingly penetrating the pharmaceutical market. Leading CRAMS entities such as SRF and PI Industries are strategically focusing on pharmaceutical opportunities. PI Industries has secured funding through a Qualified Institutional Placement (QIP) to deepen its pharmaceutical market penetration via strategic acquisitions.



Source: RHPs, DRHPs, Centrum Institutional Research

Sources: Centrum Institutional Research, EY analysis

Shifting global chemicals supply chains

China's weakening competitive advantage

Lower labor costs, high subsidies (capital and export) and relaxed environmental norms were among the key factors that led China to dominance in the global specialty chemicals industry. However, many of these factors have proven to be unsustainable in the long run.

- China's labor cost is on a sharp rise since 2008 due to policy changes and is no longer the cheapest. As a result, India has emerged as a competitive region with one of the lowest labor costs globally.
- Stricter implementation of pollution-control measures and withdrawal of subsidies have weakened China's cost advantage.
- Relocation of toxic manufacturing plants to dedicated industrial parks, along with higher operational and capital costs, has adversely impacted the operations of Chinese specialty chemical companies, resulting in large supply-chain disruptions.

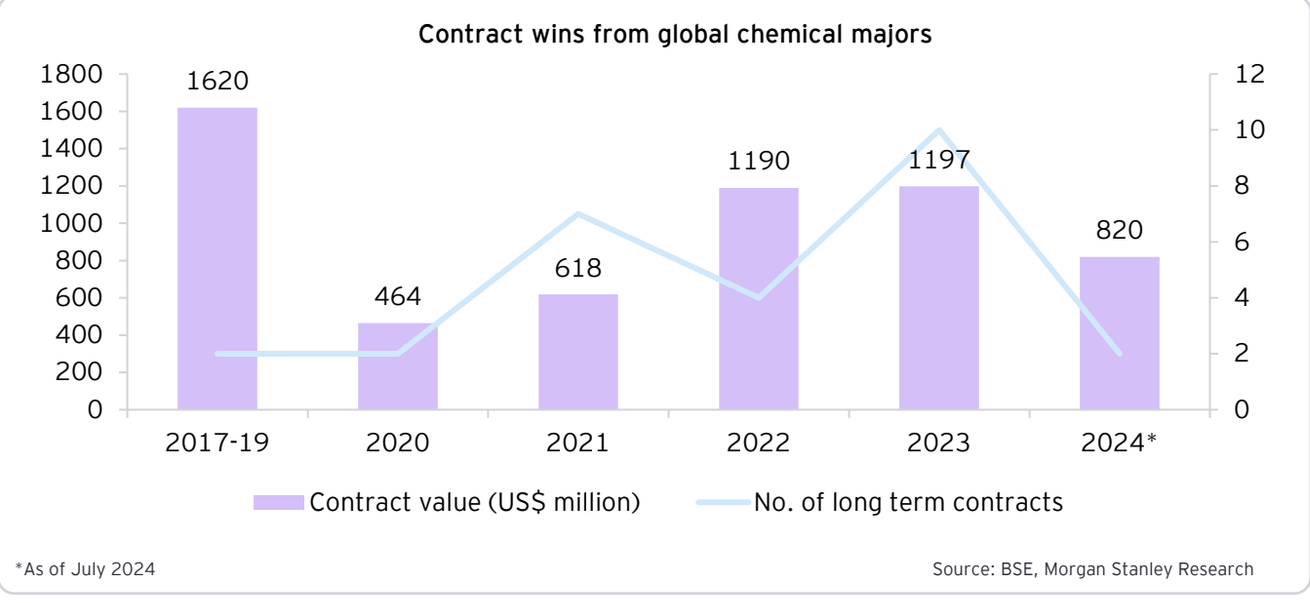
Global chemical players are increasingly shifting to an agile and disruption proof sourcing model and China's +1 strategy is central to de-risking their supply chain.

- The US-China Trade war led specialty chemical players to look beyond China as a raw material supplier and manufacturing hub.
- This shift was facilitated by the COVID-19 pandemic, which severely impacted global supply chains and highlighted the importance of diversified sourcing.

How India stands to support global supply chains as a reliable partner

India is in a unique position to support global supply chains owing to the competitive cost advantage and incentivized government policies and reforms (such as allowing 100% FDI in chemicals). China's production capacity in agrochemicals is limited, proving beneficial for Indian players as they expand capacities. If a 5% market share is shifted from China to India (currently China constitutes ~20% to 25% share in the global specialty chemicals market), there is a US$8 billion opportunity for Indian specialty chemical players. Potentially, a 20% shift in the specialty chemical supply chain from China to India can almost double the size of the Indian industry.[35]

While China has its advantage in bulk chemicals, there is a lot for India to gain in the specialty chemical space as Indian players have been garnering significant interest from global clients (Europe, Japan and now the US also) and witnessing a steady wallet share gain. Indian chemicals continue to register long-term contract wins from global chemical majors; however, momentum has slowed due to global slowdown and destocking.



*As of July 2024

Source: BSE, Morgan Stanley Research

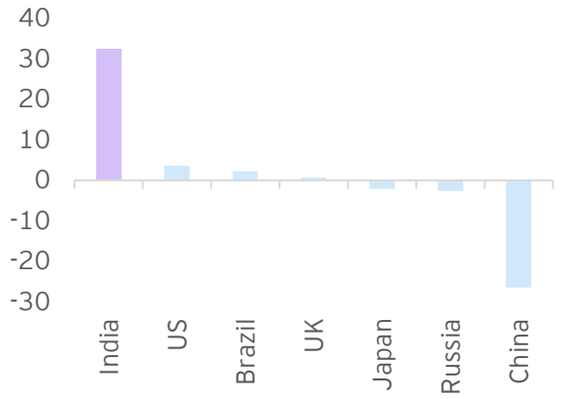
Sources: Morgan Stanley, News articles, EY analysis

India's demographic advantage

Growing labor force

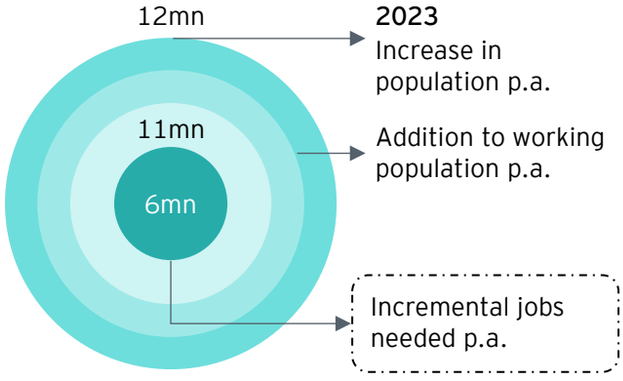
In the past couple of years, the economic trajectories of China and India have been different. Post-pandemic, China's economic rebound has been subdued while India's recovery has been comparatively strong. While the East Asian country is facing many structural challenges such as a rapidly aging population, India benefits from a young and growing workforce, coupled with a more favorable international climate. India could contribute a significant portion of the global labor force between 2024 and 2030.

Addition in labor force between 2024 and 2030 (million)



Source: ILO, UN, World Bank, UBS

Supply dynamics – addition to labor force



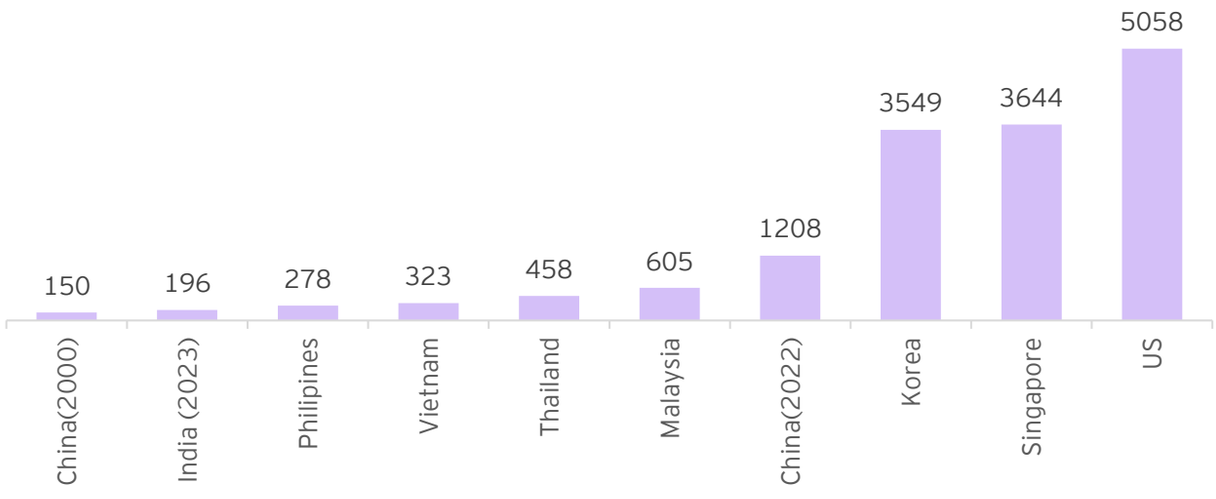
Source: NSSO, UN, ILP, planning commission, Labour Bureau, UBS

Low manufacturing labor costs

India today has 1.4 billion people and a median age of 28.2 years. The average monthly wage in India's manufacturing sector was approximately US$196 around 2023, significantly lower than in some large ASEAN economies.[36]

Manufacturing wages

Manufacturing wages 2023 (US$, monthly average)



Source: ILO, UBS

Sources: UBS, EY Analysis

India's supportive policy environment

Labor reforms

Over the past few years, India has relatively eased its labor regulations. Several states have passed laws that relax the criteria for the applicability of labor laws and extend permissible working hours. Furthermore, the consolidation of numerous labor laws into four comprehensive codes by the government is a significant overhaul that could have positive implications for the expansion of the manufacturing sector.

Land reforms

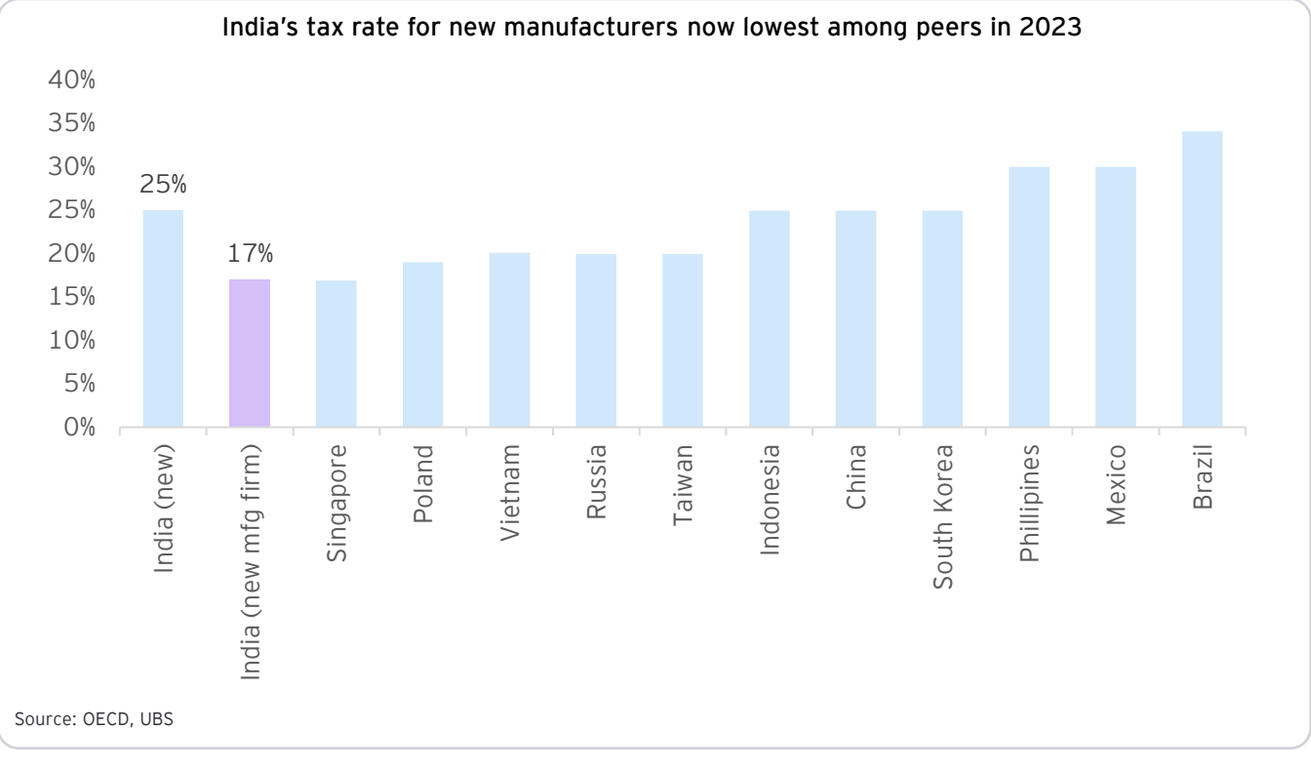
India's central and state governments have prioritized land reforms to streamline industrial development. These reforms include the establishment of land banks for swift identification and allocation of industrial projects, the transition of the land purchase process to an online platform for enhanced transparency (excluding transactions involving very large parcels), and the digitization of land records. Eleven states have expedited the land acquisition process, allowing industries to acquire substantial tracts of agricultural land for commercial use. This signals a significant shift towards facilitating industrial expansion and investment.

PLI scheme

To bolster the Atmanirbhar Bharat Abhiyaan, the Indian government introduced the PLI scheme, aimed at stimulating domestic manufacturing investments. Eligible companies receive financial incentives between 3% and 5% on incremental sales, based on the FY2020 benchmark, for products made in India within designated sectors. During the FY2021 budget announcement, Finance Minister Nirmala Sitharaman had earmarked close to INR2 trillion for the PLI scheme, targeting 13 key industries.

Remission of Duties and Taxes on Exported Products (RoDTEP)

In January 2021, the Indian government launched the RoDTEP scheme to refund taxes and levies not covered by other means, incurred in the production and distribution of exported goods. Initially excluding sectors such as chemicals, pharmaceuticals, and iron and steel, the scheme was expanded in December 2022 to cover these industries until September 2023. Due to global economic challenges, the Commerce Ministry extended the RoDTEP benefits until June 2024.



Sources: UBS, News articles, EY Analysis

Indian chemical sector: uniquely positioned for sustainability

The Indian chemical sector is poised for transformative growth as it commits to sustainable development and green technology, aiming for net zero emissions by 2070 in line with India's pledges at COP26. Comprising diverse segments such as bulk, agrochemicals, specialty chemicals, polymers, and petrochemicals, the industry is responding to the rising demand for eco-friendly products and stringent environmental norms by integrating green chemicals and practices that reduce waste and employ sustainable materials and processes.

Chemicals sector is the largest industrial energy consumer and the third-largest industry sub-sector in terms of direct carbon dioxide (CO2) emissions. The industry, especially ammonia and methanol producers, is transitioning from fossil fuel dependency to sustainable production methods. Electrolysis-based hydrogen is emerging as a key element in manufacturing sustainable aviation fuel and synthetic natural gas, offering a path to cut fossil fuel use and carbon emissions. Therefore, India's chemical sector must pivot to sustainability, leveraging alternative feedstocks and embracing low-carbon energy sources such as biomass, hydrogen, and bio-CNG. Innovations in bioplastics, including biodegradable polymers and seaweed-based edible straws, are key to curbing plastic pollution and reducing reliance on single-use plastics.

PLI for green hydrogen and ammonia[37]

The GoI is planning to introduce a PLI scheme to subsidize production and export of green hydrogen and ammonia. The scheme is expected to encompass incentives for electrolysers, components, storage facilities, and ammonia production loop studies. The incentives, designed to span five years, aim to facilitate at least 10 million MTPA of green hydrogen exports by 2030, with aspirations to cultivate a 50 million MTPA market for green hydrogen and ammonia in India by the same year.

The power ministry announced a goal in February 2022 to produce 5 million tons of green hydrogen annually by 2030. To support this objective, dedicated manufacturing zones with waived inter-state power transmission charges for green hydrogen and ammonia production will be established. Concurrently, Reliance Industries and Adani Group have announced significant investments of US$75 billion and US$20 billion, respectively, in renewable energy infrastructure.

Sources: UBS, EY Analysis

Challenges for the chemical industries in deeper GVC integration

Raw material related challenges in terms of import dependence

India has seen a consistent rise in import dependency across the chemicals value chain over the years with total CPC imports growing at a CAGR of 12.5% from FY19 to FY23.[14] As a result, India continues to rely heavily on imports, especially for higher-value-added intermediate or finished goods which are mostly sourced from China (10%-40%). Given the various ongoing geopolitical tensions and fluctuating global trade relations with China, being overly dependent on imports from one region can hinder India's self-sufficiency for deeper GVC integration.

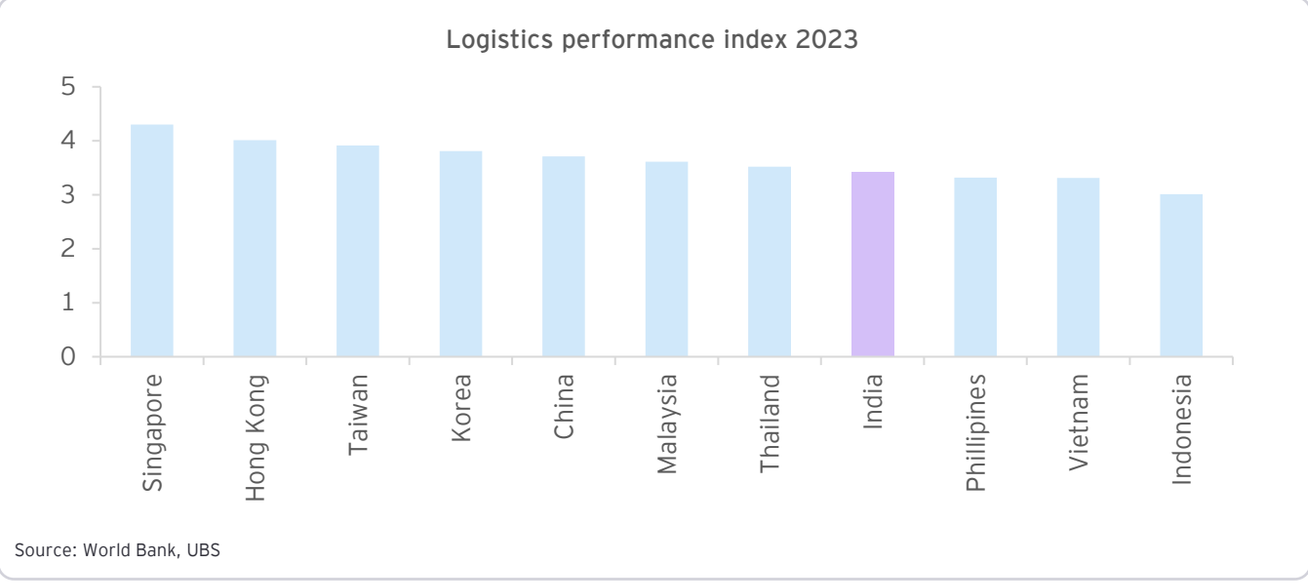
Notably, imports of organic chemicals drove most of the increase in bulk chemical imports, with organic chemical imports rising at a 17.9% CAGR from FY19 to FY23.[14] India's oil import dependency stood at 86.4% from April to July 2022, as per the Ministry of Petroleum and Natural Gas. Indian petrochemical companies face supply chain vulnerabilities due to external factors, notably the difficulty in obtaining Russian crude amidst Western sanctions. The ongoing Middle East conflict also poses a threat to global oil supply stability. Furthermore, the higher cost of imported crude oil and natural gas challenges Indian producers' competitiveness against foreign products.

India's fertiliser sector is constrained by a lack of domestic raw materials, necessitating full import of the muriate of potash and partial import of rock phosphate. India sources potash from diverse but geopolitically sensitive regions, including Belarus, Russia, Israel, and Jordan, with supply stability concerns amplified by strained relations with a key supplier, Canada. This import reliance has led to an overdependence on urea, resulting in soil nutrient imbalances and reduced agricultural yields.

High logistics costs[38]

India's logistics sector has historically been burdened by high costs, fragmented supply chains, and inadequate infrastructure. The Economic Survey 2022-23 highlights that logistics costs in India have persistently ranged between 14% and 18% of the Gross Domestic Product (GDP). This starkly contrasts with the global benchmark of 8% and highlights the inefficiencies in India's logistics sector, pointing to the necessity for targeted measures to align the country's logistics expenses with global norms.

In December 2023, the National Council of Applied Economic Research (NCAER) introduced a fresh perspective in its report on logistics costs in India. The report indicates that in the fiscal year 2021-22, logistics expenses accounted for 7.8% to 8.9% of the GDP, reflecting a downward trend despite a temporary rise during 2017-18 and 2018-19. The latest NCAER report highlights the lack of official GDP percentage figures for logistics costs, citing estimates from private and academic sources and emphasizing the importance of accurate metrics to assess India's logistics efficiency.



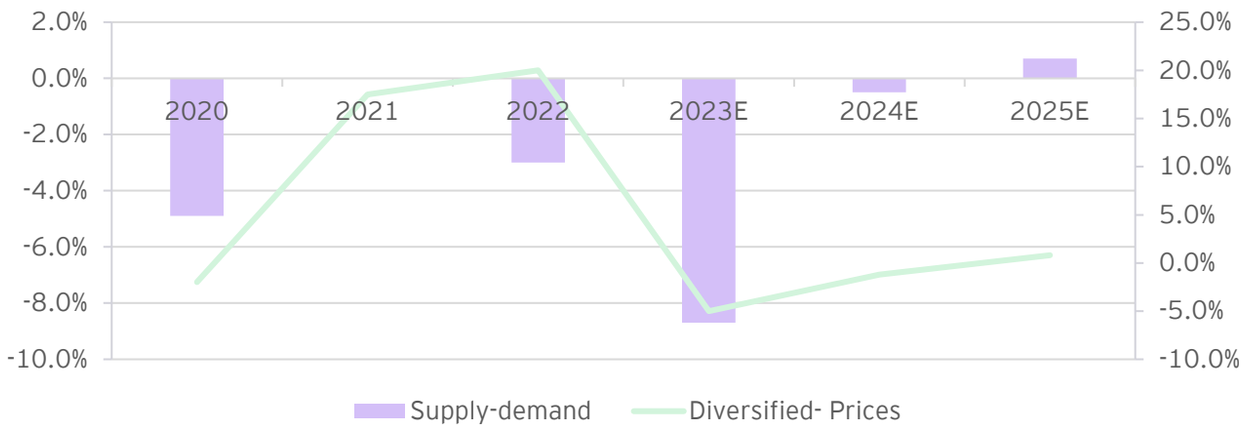
Source: World Bank, UBS

Sources: UBS, News articles, EY Analysis

Challenges faced from global competitors, such as China and global overcapacity issues

The global chemical sector is anticipated to persist in its economic slump through 2024, grappling with a significant oversupply, largely attributed to China's oversupply. With domestic demand falling short, China is exporting chemicals at record levels, thus forcing their price decline. Industries in Germany and Europe are bearing the brunt of these developments. Lower utilization is expected across basic chemicals, bulk plastics and major petrochemical value chains (ethylene, propylene, polyethylene terephthalate, PVC) in APAC. This is expected to result in an oversupply in the near term until 2025, driven primarily by a slowdown in demand in China.

Global chemicals price and supply/demand trends



Source: Company Data, UBS estimates

Since 2020, China has invested in substantial new production capacities in this sector, aggressively entering the global market where demand continues to be flat. This has led to several plant closures across Europe. The European chemical industry is facing significant challenges due to a surplus in domestic production, cheap imports, high interest rates, and rising input costs, along with projections of slow demand growth. European petrochemical companies are struggling with a fundamental crisis, as low expectations for demand expansion and excess capacity offer little cause for optimism. Industrial demand is still 25% below pre-COVID and pre-Russia-Ukraine war levels.[38]

Inadequate R&D infrastructure

Indian chemical companies typically allocate less than 3% of their revenues to research and development, while their global counterparts allocate between 6% and 10%.[12] This highlights the fund gap in India's chemicals R&D infrastructure. Consequently, the Indian specialty chemicals sector faces the risk of not capitalizing on the value creation opportunities presented by the development of innovative and bespoke products required by downstream markets. This also forces end-users to rely on higher value-added imports, adding to India's import dependence.

The Indian chemical industry contends with a scarcity of skilled research and development professionals. A limited number of chemical engineers graduate annually from the nation's premier institutions, with many pursuing further education or changing fields, resulting in a dearth of specialized PhDs. Consequently, India relies on international expertise to meet its chemical R&D requirements.

Sources: UBS, News articles, EY Analysis

8

Strategic roadmap

Role of technology and R&D in increasing GVC integration

The role of technology and R&D in increasing Global Value Chain (GVC) integration in the Indian chemical industry is pivotal. Advanced technologies, such as artificial intelligence, machine learning, and the Internet of Things (IoT) are transforming production processes, making them more efficient and sustainable. These technologies enable real-time monitoring and optimization of manufacturing operations, reducing waste and energy consumption. Additionally, digitalization facilitates better supply chain management, enhancing transparency and traceability, which are crucial for meeting global standards and regulations. By investing in cutting-edge R&D, Indian chemical companies can develop innovative products and processes that meet the evolving needs of global markets, thereby strengthening their position in the GVC.

Furthermore, targeted R&D investments are essential for product differentiation and value creation. By focusing on sustainable and high-performance chemicals, manufacturers can cater to the growing demand for eco-friendly products. This not only helps in reducing the industry's carbon footprint, but also opens up new market opportunities where sustainability is a key criterion. Collaborative R&D efforts with global partners can lead to the development of breakthrough technologies and products, further integrating Indian companies into the global value chain.

Forging strategic partnerships (such as FTAs with the US and EU)

India has signed 14 FTAs, including four with the European Free Trade Association (EFTA) (Iceland, Liechtenstein, Norway, and Switzerland). Recent agreements were made with Mauritius, the UAE, and Australia. Ongoing negotiations may lead to over 120 preferential relationships through FTAs with the UK and EU.[39]

The Indian chemical industry should focus on enhancing regulatory alignment with international standards, including safety, environmental sustainability, and quality control. The Indian government should engage in proactive diplomacy to build strong relationships with key stakeholders in the US and the EU, potentially signing FTAs in the future. This involves participating in trade missions, industry forums, and bilateral meetings to advocate for the interests of the Indian chemical sector. Leveraging initiatives such as Make in India and Atmanirbhar Bharat, the industry can showcase its potential as a global manufacturing hub. Emphasizing sustainability and eco-friendly practices may align with global trends, making Indian products more attractive.

Sources: News articles, EY Analysis

Attracting investments in the sector

The Indian government recognizes the chemicals sector's importance to economic growth and has adopted a liberal approach to attract foreign investments, allowing 100% FDI through the automatic route in most categories, except for certain hazardous chemicals. Initiatives such as Make in India and Atmanirbhar Bharat Abhiyan aim to reduce import dependency, and a proposed PLI scheme seeks to boost domestic manufacturing capacity.

By pursuing initiatives such as extending the PLI scheme to the chemical sector and renegotiating the terms of FTAs with other chemical-exporting nations, such as Japan, the government could pave the way for investments in the speciality chemicals industry. Additionally, India should focus on enhancing infrastructure, streamlining regulatory processes, and ensuring policy stability. Additionally, fostering innovation through R&D incentives, building skilled labor pools, and strengthening intellectual property rights will make the Indian chemicals sector even more attractive to global investors.

Focus on bioplastics and other biodegradable options

The Indian chemical industry should focus on bioplastics and invest in R&D to develop biodegradable bioplastics, such as PLA and PHA, which is crucial. These materials have proven applications in various industries, from 3D printing to single-use items, and their compostability makes them attractive for reducing plastic waste. Establishing dedicated bioplastic production facilities, similar to those in France, Thailand, and China, will enable India to scale up production and meet both domestic and international demand.

Moreover, fostering partnerships with global leaders in bioplastic technology can accelerate the adoption of advanced manufacturing processes and innovations. For instance, Indian players can collaborate with bioplastics and biodegradable solutions companies that can provide valuable insights and technological expertise. Additionally, the Indian government should consider implementing incentives such as tax breaks and grants for bioplastic R&D and production, similar to the proposed PLI scheme for the broader chemicals sector. By focusing on these strategic initiatives, the Indian chemical industry can enhance its competitiveness, contribute to global sustainability efforts, and tap into new market opportunities driven by the demand for eco-friendly materials.

End-of-life cycle solutions

The Indian chemical industry should prioritize the adoption of circular economy principles. This involves enhancing recycling infrastructure to efficiently process chemical waste and convert it into valuable resources. Implementing advanced technologies in chemical recycling and pyrolysis can transform mixed plastic waste into reusable raw materials, reducing reliance on incineration and landfills. Additionally, fostering partnerships with global leaders in sustainable practices will bring in expertise and innovative solutions. The industry should also focus on comprehensive life cycle assessments (LCA) to measure and minimize environmental impacts at each stage of the product life cycle.

Additionally, adding circularity as a key KPI for sustainable reporting standards, such as the European Sustainability Reporting Standards (ESRS) is necessary to pave the way for more circular solutions in the industry.

For the Advanced Chemistry Cell (ACC) ecosystem, the PLI scheme should focus on building a comprehensive value chain that includes polymer films, fluoropolymers, electrolyte salts, and additives. With incentives amounting to INR181 billion, the scheme can stimulate investments in this nascent yet rapidly growing segment.[36] Indian companies such as Gujarat Fluorochemicals, Neogen Chemicals, and Tatva Chintan Pharma Chem have already initiated their participation in the ACC value chain. By fostering R&D and innovation, and providing targeted incentives, the government can accelerate the development of the ACC ecosystem, positioning India as a global leader in new energy technologies.

Sources: News articles, EY Analysis

Chemical hubs and parks

To overcome the challenges that PCPIRs face, India must adopt a strategy that emphasizes streamlined regulatory processes and robust infrastructure development. Accelerating land acquisition and environmental approvals is crucial to avoid bureaucratic delays. The government should establish a dedicated task force to expedite these processes and ensure timely project execution. Drawing inspiration from global benchmarks such as BASF's Verbund and Singapore's Jurong Island, India can develop integrated chemical hubs that offer world-class infrastructure, shared utilities, and efficient logistics. These hubs should be designed to attract both domestic and international investors by providing a conducive business environment and fostering innovation through collaborative R&D centers.

Additionally, with close collaboration between the Central and State governments, PCPIRs should be successfully implemented in certain states by aligning objectives and streamlining policy frameworks, by learning from the successful models of some global chemical hubs. India can create a competitive edge by focusing on sustainability, advanced manufacturing technologies, and skilled workforce development in the PCPIRs.

Other incentives such as tax, interest subventions

To further stimulate growth in the Indian chemical industry, the government should implement additional incentives such as tax benefits and interest subventions. Enhancing tax advantages under schemes such as the Department of Scientific and Industrial Research (DSIR) can encourage more investment in R&D, fostering innovation and the development of new technologies. Offering capital subsidies of 10%-20% for large investment projects can also drive capacity expansions. Additionally, providing interest subventions on loans for green and sustainable projects will support the industry's transition to more eco-friendly practices. These measures, combined with existing initiatives, will create a more attractive investment environment, boosting the sector's global competitiveness and sustainability.

Sources: ICIS, News articles, EY analysis

Glossary

ACC –	Advanced Chemistry Cell
APAC -	Asia-Pacific
ASEAN -	Association of Southeast Asian Nations
BDO -	Butanediol
BRSR -	Business Responsibility and Sustainability Report
CAGR –	Compound Annual Growth Rate
CO2 -	Carbon Dioxide
COP26 -	26th UN Climate Change Conference of the Parties
CPC -	Chemicals and Petrochemicals
CRAMS -	Contract Research and Manufacturing Services
CSRD -	Corporate Sustainability Reporting Directive
EFTA -	European Free Trade Association
ESRS -	European Sustainability Reporting Standards
EU -	European Union
EV -	Electric Vehicle
FDI -	Foreign Direct Investment
FII -	Foreign Institutional Investment
FTA -	Free Trade Agreement
GDP -	Gross Domestic Product
GFCF -	Gross Fixed Capital Formation
GRI -	Global Reporting Initiative
GST -	Goods and Services Tax
IIP -	Index of Industrial Production
IoT -	Internet of Things
LCA -	Life Cycle Assessment
NCAER -	National Council of Applied Economic Research
NSE -	National Stock Exchange
PBAT -	Polybutylene Adipate Terephthalate
PBST –	Poly (Butylene Succinate-co-Terephthalate)
PBS –	Polybutylene Succinate
PBT –	Polybutylene Terephthalate
PCPIR –	Petroleum, Chemicals, and Petrochemicals Investment Regions
PHA –	Polyhydroxyalkanoates
PLA –	Polylactic Acid
PP –	Polypropylene
LLDPE –	Linear Low Density Polyethylene
HDPE –	High Density Polyethylene
MEG -	Monoethylene Glycol
DEG –	Diethylene Glycol
PLI –	Production Linked Incentive
PMI –	Purchasing Managers' Index
QIP –	Qualified Institutional Placement
RBI –	Reserve Bank of India
RoDTEP –	Remission of Duties or Taxes on Export Products
SAF –	Sustainable Aviation Fuels
SASB –	Sustainability Accounting Standards Board
SEBI –	Securities and Exchange Board of India
SEZ –	Special Economic Zone
SGB –	Sovereign Green Bond
TCFD –	Task Force on Climate-related Financial Disclosures
US -	United States

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Acknowledgements

Author

Aashish Kasad
Partner and EY India National Leader - Chemicals and Agriculture sector; India Region Diversity & Inclusiveness Business Sponsor
Email: aashish.kasad@in.ey.com

Contributors

Jiwanjot Singh
Assistant Director, Industrials and Energy, EY

Vedant Karnatak
Supervising Associate, Industrials and Energy, EY

EY offices

Ahmedabad
22nd Floor, B Wing, Privilon
Ambli BRT Road, Behind Iskcon Temple
Off SG Highway
Ahmedabad - 380 059
Tel: + 91 79 6608 3800

Bengaluru
12th & 13th Floor
"UB City", Canberra Block
No.24 Vittal Mallya Road
Bengaluru - 560 001
Tel: + 91 80 6727 5000

Ground & 1st Floor
11, 'A' wing
Divyasree Chambers
Langford Town
Bengaluru - 560 025
Tel: + 91 80 6727 5000

3rd & 4th Floor
MARKSQUARE
#61, St. Mark's Road
Shantala Nagar
Bengaluru - 560 001
Tel: + 91 80 6727 5000

1st & 8th Floor, Tower A
Prestige Shantiniketan
Mahadevapura Post
Whitefield, Bengaluru - 560 048
Tel: + 91 80 6727 5000

Bhubaneswar
8th Floor, O-Hub, Tower A
Chandaka SEZ, Bhubaneswar
Odisha – 751024
Tel: + 91 674 274 4490

Chandigarh
Elante offices, Unit No. B-613 & 614
6th Floor, Plot No- 178-178A
Industrial & Business Park, Phase-I
Chandigarh - 160 002
Tel: + 91 172 6717800

Chennai
6th & 7th Floor, A Block,
Tidel Park, No.4, Rajiv Gandhi Salai
Taramani, Chennai - 600 113
Tel: + 91 44 6654 8100

Delhi NCR
Aikyam
Ground Floor
67, Institutional Area
Sector 44, Gurugram - 122 003
Haryana
Tel: +91 124 443 4000

3rd & 6th Floor, Worldmark-1
IGI Airport Hospitality District
Aerocity, New Delhi - 110 037
Tel: + 91 11 4731 8000

4th & 5th Floor, Plot No 2B
Tower 2, Sector 126
Gautam Budh Nagar, U.P.
Noida - 201 304
Tel: + 91 120 671 7000

Hyderabad
THE SKYVIEW 10
18th Floor, "SOUTH LOBBY"
Survey No 83/1, Raidurgam
Hyderabad - 500 032
Tel: + 91 40 6736 2000

Jaipur
9th floor, Jewel of India
Horizon Tower, JLN Marg
Opp Jaipur Stock Exchange
Jaipur, Rajasthan – 302018

Kochi
9th Floor, ABAD Nucleus
NH-49, Maradu PO
Kochi - 682 304
Tel: + 91 484 433 4000

Kolkata
22 Camac Street
3rd Floor, Block 'C'
Kolkata - 700 016
Tel: + 91 33 6615 3400

Mumbai
14th Floor, The Ruby
29 Senapati Bapat Marg
Dadar (W), Mumbai - 400 028
Tel: + 91 22 6192 0000

5th Floor, Block B-2
Nirlon Knowledge Park
Off. Western Express Highway
Goregaon (E)
Mumbai - 400 063
Tel: + 91 22 6192 0000

3rd Floor, Unit No 301
Building No. 1
Mindspace Airoli West (Gigaplex)
Located at Plot No. IT-5
MIDC Knowledge Corridor
Airoli (West)
Navi Mumbai - 400708
Tel: + 91 22 6192 0003

Altimus, 18th Floor
Pandurang Budhkar Marg
Worli, Mumbai - 400 018
Tel: +91 22 6192 0503

Pune
C-401, 4th Floor
Panchshil Tech Park, Yerwada
(Near Don Bosco School)
Pune - 411 006
Tel: + 91 20 4912 6000

10th Floor, Smartworks
M-Agile, Pan Card Club Road
Baner, Taluka Haveli
Pune - 411 045
Tel: + 91 20 4912 6800

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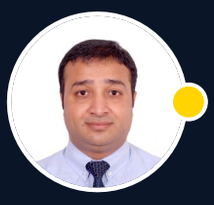

Manoj Mehta
Senior Director & Head - Chemicals & Petrochemicals, FICCI
Email: Manoj.mehta@ficci.com

Contact:

Aashish Kasad
Partner and EY India National Leader - Chemicals and Agriculture sector; India Region Diversity & Inclusiveness Business Sponsor
Email: aashish.kasad@in.ey.com

ey.com/en_in

@EY_India EY EY India EY Careers India @ey_indiacareers