



TATA STRATEGIC MANAGEMENT GROUP



Gujarat Specialty Chemicals Conclave-2013

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**Theme: The Potential of Specialty Chemicals
Industry in Gujarat**

“Knowledge cum Strategy Paper”



Message



Naina Lal Kidwai

President, FICCI &
Country Head-HSBC India &
Director- HSBC Asia Pacific

The Chemical industry is critical for the economic development of any country, providing products and enabling technical solutions in virtually all sectors of the economy. Specialty Chemicals are the fastest growing segment in the chemical industry. These are high value, low volume chemicals known for their end-use applications and/or have performance enhancing properties. There is immense potential for increasing consumption within the country as also for India to become a reliable supplier of such quality chemicals to the world.

Compared to United States, Europe and even China, there is comparatively very low usage of such chemicals in India. Increasing judicious usage of such chemicals will not only help in the growth of this important segment of the chemical industry but also facilitate overall economic growth.

Gujarat is the hub of the Indian Chemical industry, contributing to over 50% of its production. I am delighted that Federation of Indian Chambers of Commerce & Industry jointly with the Government of Gujarat and CHEMEXCIL is organising a Conclave on Specialty Chemicals, with a focus on Gujarat. The purpose of this Conclave is to discuss the issues and potential of the sector and determine the way forward. I am confident that the Conclave will achieve these objectives and wish it every success

(Sd/-)

Naina Lal Kidwai

B. B. SWAIN IAS
Vice Chairman & Managing Director



GIDC

Gujarat Industrial Development Corporation
(A Government of Gujarat Undertaking)
2nd Floor, Block No. 4, Udyog Bhavan
Sector 11, Gandhinagar - 382 017
Gujarat, India.

Message for Gujarat Speciality Chemicals Conclave

I am happy to know that the FICCI and CHEMEXCIL are organising a Conclave on Speciality Chemicals with the active support of Government of Gujarat. Chemical industry plays an important role for the welfare of the society and development of a nation. Speciality chemicals is a knowledge driven segment which facilitates different segments of economy. The sector has huge potential considering the talent pool and huge untapped demand with in the country considering the present very low levels of consumption. Approx. 200 million Indian middle class consumers need more high-quality end products. These all are indications of the days of growth for this important sector.

Over the past two decades, Gujarat has become one of the most preferred locations for industrial investment in India and now accounts for over 50% of national chemical production. The PCPIR at Dahej is also at an advanced stage of implementation and is expected to become an engine of growth for the chemical sector.

I wish all the success to this Conclave.

(B.B.Swain)

Vice Chairman & Managing Director

Foreword



Manish Panchal
Practice Head - Chemical & Energy
Tata Strategic Management Group
manish.panchal@tsmg.com



Charu Kapoor
Engagement Manager - Chemicals
Tata Strategic Management Group
charu.kapoor@tsmg.com



P S Singh
Head- Chemicals
FICCI
Prabhsharan.singh@ficci.com

TATA Strategic team has been privileged to work closely with some of the best global names in speciality chemical industry on various strategic business issues; this gives us the added advantage writing this report. This report attempts to provide an overview of the speciality chemicals industry, its growth prospects and its close linkage to Gujarat State and challenges it faces today. We also recommend strategic imperatives for manufacturers and end users.

Indian speciality chemicals market size is approximately USD 23 Bn, and it has seen strong growth at 14% per annum. While the growth rate is strong, still the consumption levels of speciality chemicals and additives are very low in India as compared to other peer countries. This implies that there is tremendous scope for consumption levels to rise in coming decades. We are of the opinion that Indian speciality chemical industry is at an inflection point and will be a major contributor to the country's growth in coming decade.

However, the success of this sector will depend on how well it manages its key challenges, some of which include dependence upon imports for intermediates, high fragmentation, small capacities and limited focus on technology up-gradation.

Gujarat has been the leading state in terms of attracting investment for chemicals industry and today known as the 'Petro Capital' of India. It contributes significantly to the country's petrochemicals production (62 %), chemicals production (51 %) and pharmaceuticals production (35 %). Its business friendly policies have made it the first choice for investors. In 2011 alone it signed more than 80 MoU's with an aggregate proposed investment of Rs. 55,000 Crores.

We are grateful to FICCI for giving us this opportunity to partner with them in the preparation of this Knowledge Paper.

It was an exciting and enriching experience for TATA Strategic (Chemicals) team to put this report together in a short time and we sincerely hope this sets the motivation for companies to formulate strategies to address key challenges and help in creating a dynamic and vibrant speciality chemicals industry in Gujarat.



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I. Executive summary

This FICCI report as part of the Gujarat specialty chemicals conclave, prepared by Tata Strategic Management Group, provides an analysis of key industry segments in India within specialty chemicals. The report highlights the current market size, project future market size and growth, map demand-supply scenario and outline the demand drivers. It also provides insights on key market, technology and regulatory trends and concludes with a brief outlook on the levers for delivering growth through capitalizing on opportunities and addressing imminent challenges. The report provides an overview of the business environment in the state of Gujarat, with special emphasis on specialty chemicals. It describes salient features and key developments in the investing climate and industrial policy of the state.

Over the past two decades, Gujarat has become one of the most preferred locations for industrial investment in India. Gujarat has achieved an annual growth rate of over 10% p.a. over the past five years and is one of the most industrialized states of India. It accounts for 16% of the nation's industrial production and 22% of its exports. Gujarat possesses several advantages which have enabled it to chart a path of rapid growth and industrialization such as sound infrastructure facilities, availability of skilled and semi-skilled manpower, excellent domestic and international connectivity and rich natural resources. The key differentiating factor has been Gujarat's investor-friendly policy towards industrial development. These have resulted in Gujarat evolving as the hub of India's chemical and petrochemical industry - with the state accounting for more than half of India's total chemical industry and ~63% of total national petrochemical production. The chemical industry is today the largest and fastest growing component of Gujarat's manufacturing sector.

Specialty chemical industry is a knowledge driven industry and it has been growing rapidly at 1.2-1.3x of GDP growth rate (~12%) over the last five years. It currently stands at ~\$21.5 billion. Domestic demand of specialty chemicals is expected to follow an accelerated growth path. This demand is mostly driven by the strong growth outlook for end use industries. This along with increased adoption of specialty chemicals and newer applications can propel the growth further.

Indian specialty chemical manufacturers have strong presence in export market also. APIs and colorants (including dyes and pigments) are the key products exported. India exports specialty chemicals to nearby Asia-Pacific countries which don't have competitive scale of production. India also exports to developed countries of Europe and USA where it leverages its low cost of production and quality talent pool. Ability of companies to comply with global regulations and India's manufacturing competitiveness has helped the export market to grow significantly.

The key specialty segments in India are agrochemicals, paints coating and construction chemicals, colorants, Active Pharmaceutical Ingredients (APIs), personal care chemicals and flavors & fragrances. The critical success factors for most of the specialty chemical segments include understanding of customer needs and product/ application development to meet the same at a favorable price-performance ratio.

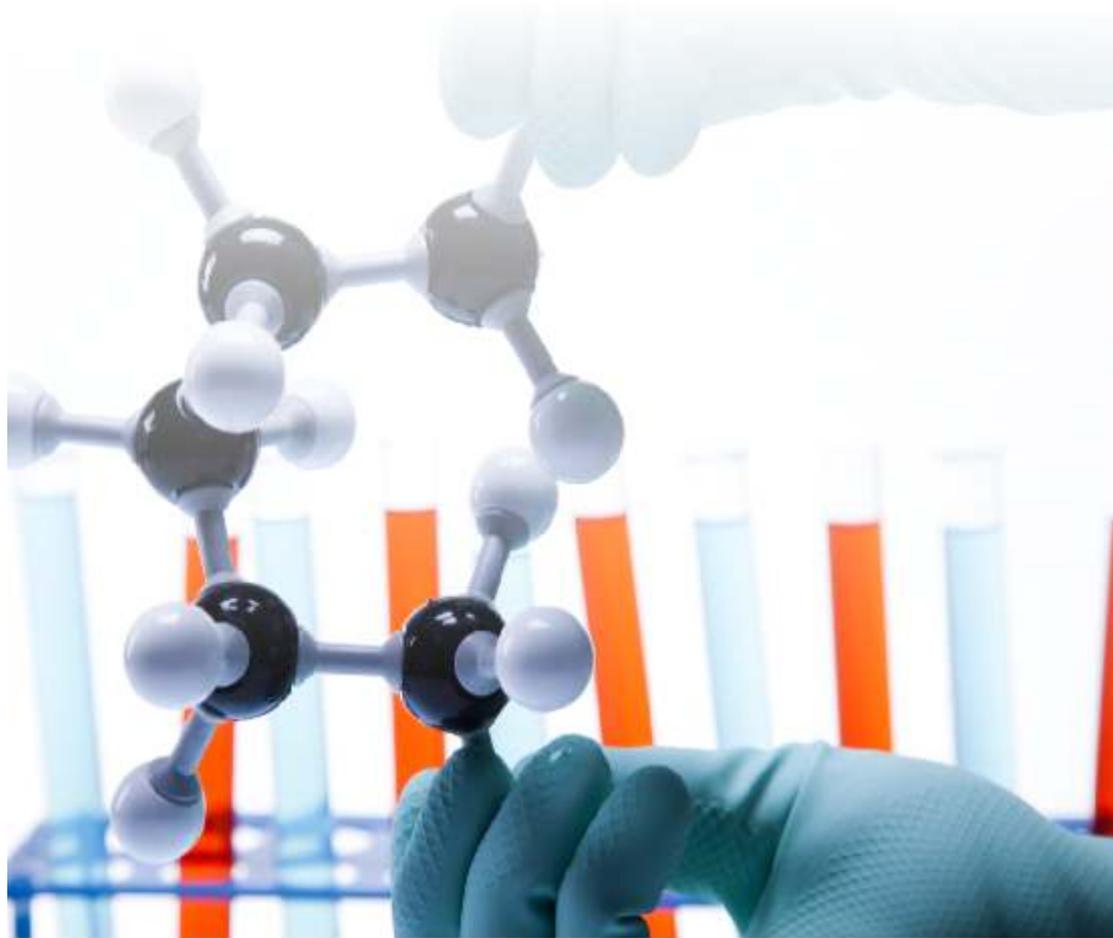
Going ahead innovation and sustainability initiatives are expected to be major factors for competitiveness. Development of processes/ products which eliminate or reduce the use of hazardous substances could become the key priority of producers. Consumers would be expected to pay premium for green chemistry and environmental preservation initiatives and appreciate this globally. Moreover stringent regulatory norms could further push the need for innovation.

Currently the domestic specialty chemical producers also face challenges related to feedstock availability, higher operational costs, outdated technology/ process, limited investment in R&D & a negative perception amongst end consumers. Apart from depending on regulatory interventions, Indian players should come together and proactively work towards collaborative investment to avert global competition.



II. Introduction

Specialty chemicals are defined as a "group of relatively high value, low volume chemicals known for their end use applications and/ or performance enhancing properties." In contrast to base or commodity chemicals, specialty chemicals are recognized for 'what they do' and not 'what they are'. Specialty chemicals provide the required 'solution' to meet the customer application needs. It is a highly knowledge driven industry with raw materials cost (measured as percentage of net sales) much lower than for commodity chemicals. The critical success factors for the industry include understanding of customer needs and product/ application development to meet the same at a favourable price-performance ratio.



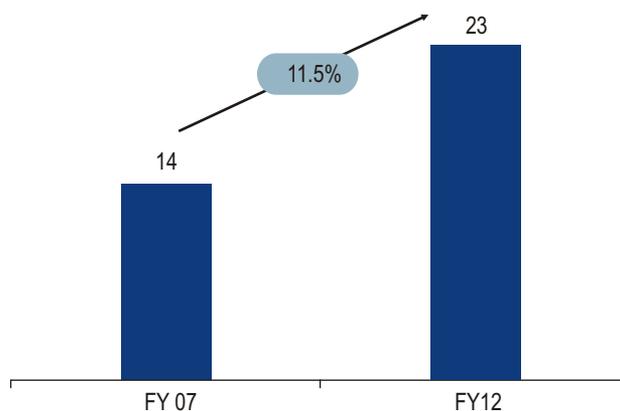
III. India scenario

1. Market size

Indian chemical industry is rapidly growing industry and is estimated at ~\$100 billion (for FY12). Of this the specialty chemicals account for ~23%, i.e. ~\$23.3 billion (~\$19.5 billion of specialty chemicals and ~\$3.8 billion of agrochemicals, APIs not included here).

Specialty chemicals have observed a high growth rate in the past and have grown at ~11.5% p.a. since FY07 when the market size was ~\$13.5 billion (Refer Figure III 1).

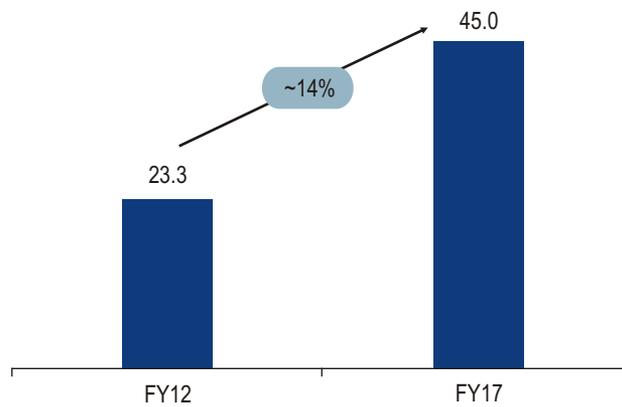
Figure III 1: Past growth of specialty chemicals in India, \$ Bn



The past growth has been mostly due to growth in end use industries in the past, which has resulted in increased consumption for specialty chemicals. Going ahead, the growth potential of the specialty chemicals consumption in India will remain strong (Refer Figure III 2) and it is expected to reach ~\$ 45 billion by FY17 (\$38.5 billion for specialty chemicals and \$6.5 billion for agrochemicals)

The key segments in Indian markets are: Agrochemicals, Paints & coatings, Specialty polymers, Home care surfactants, plastic additives, textile chemicals, construction chemicals, water chemicals, personal care ingredients, Flavors & fragrances, paper chemicals, printing inks, industrial & institutional cleaners, rubber chemicals etc. This segmentation does not highlight the colorants separately (dyes & pigments) as the colorants are mostly used in many of the listed categories of specialty chemicals like paints & coatings, Inks, plastic additives, Textile chemicals etc.

Figure III 2: XIIth plan targeted growth for specialty chemicals in India, \$ billion



2. Growth drivers

The expected growth rate of specialty chemicals in India is broadly much higher than global standards. This is because the specialty chemical usage is at a nascent stage in India, with increasing applications and increased adoption in existing applications to follow. Also the export potential of specialty chemicals is a strong driver in increasing cost effectiveness of manufacturers and making the product cheaper for consumption in India. Broadly the growth is driven by the following three factors:

a. Higher end use demand

With increasing GDP, the Indian middle-class is expected to grow from 31 million households in 2008 to 148 million households by 2030, with quadrupled consumption. Furthermore, India's urban population is expected to increase by 275 million people by 2030. This will result in consumption-led double-digit growth in key end markets over the next decade and an increased need for better products and services.

Specialty chemical industry growth typically follows the growth of these key end markets. For example, an increasingly urbanized India (cities are likely to comprise 40% of the population by 2030) will double the requirement for clean municipal water by 2020, and therefore significantly increase municipalities' usage of water treatment chemicals to treat/ recycle waste water. Similarly, increased infrastructure spending by the government (The XIIth Plan recommends USD 1 trillion investment in development of roads, ports, power and telecom) accompanied by growth in the real-estate industry, could result in over 15 % p.a. growth in the construction chemicals and coatings segment.

b. Increased intensity of consumption

Compared to the developed world (the US, Europe) or China, the current penetration of specialty chemicals within India's end markets is low. With an increased focus on improving products, usage intensity of specialty chemicals within these end markets will rise in India over the next decade.

For example, India's current expenditure on admixtures is only \$1/ m³ of concrete, compared to \$2/ m³ in China and \$4.5/ m³ in US. This is primarily due to the lack of awareness of admixtures in the Indian construction industry which provides benefits, such as improve the fluidity of concrete, provide a smoother, more even finish, and helps avoid cracks. Concrete admixtures can also help reduce maintenance and repair costs, and therefore, the total cost of ownership of construction projects in India. With increasing demand for higher quality construction and increasing awareness of concrete admixture benefits the industry could double the intensity of admixture consumption in India.

Similarly, the usage of pesticides in India is 0.58 kg/ ha compared to 2 kg/ ha in China. To meet India's food requirements - spurred by increasing population, rising income, and limited availability of arable land - the yield per hectare will need to be increased considerably (e.g., crop productivity in India is at 2 MT/ ha compared to China at 5 MT/ ha). This can be achieved through multiple means (e.g., larger fields, better automation, improved irrigation infrastructure), along with increased use of agrochemicals.

c. Improved consumption standards

Consumption standards are policies implemented by the government to promote the safe use of products. These standards are necessary for both improving society's standard of living and enhancing consumer safety. Most developed countries (e.g. the US, Germany) have implemented stringent consumption standards across various end-use markets. As the economy develops, India will need to regulate products more stringently, and strengthen consumption standards, which in turn will promote increased usage of specialty chemicals. For instance, the US and Germany are very strict on the usage of solvents in paints and limit the volatile organic compound (VOC) content. India still uses enamel paints with high VOC content. Mandating the usage of water-based paints (that contain 5-15% petrochemicals) will help ensure health and safety of consumers, and encourage the consumption of higher priced, water based paints (increasing the segment's value).

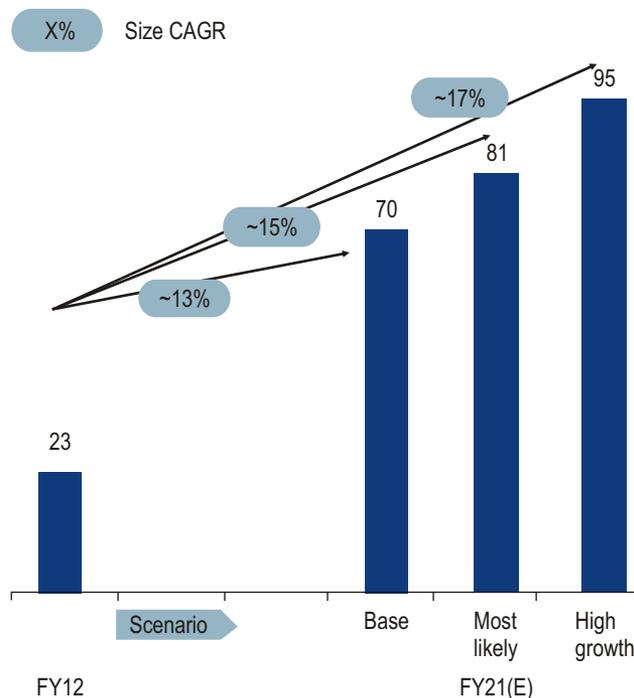
d. Enabling infrastructure & manufacturing environment

- i. National Manufacturing Policy which aims at enhancing share of manufacturing in national GDP from 16% to 25% by 2022.
- ii. Focus on infrastructure development : Government of India's commitment to increase spend in infrastructure to 10% of GDP in the 12th Five-Year Plan
- iii. India is likely to develop into a manufacturing hub as the industry is shifting away from developed economies with higher cost of production to developing economy. India acts an ideal location based on its skill pool as well as low cost of manufacturing
- iv. Creating of chemical clusters dedicated to specific segments of the chemical industry will ensure that optimum safety, logistics and infrastructure is provided for making the infrastructure & manufacturing environment truly world class at low cost.

3. Growth projections

The market size of specialty chemicals in India has the potential to reach \$70- \$90 billion by FY21. The base case growth rate is expected to slightly lower than the XIIth five year plan targets with an expected growth of ~13% p.a. And the optimistic case is likely to achieve a growth of ~17% p.a. over the next decade. (Refer Figure III 3)

Figure III 3: Growth projections of specialty chemicals market size, \$ Bn





The base case scenario growth is mostly driven by the expected growth in end use industries and increasing penetration of specialty chemicals in them which results in almost ~2X GDP growth rate. The enablers for a most likely growth or higher growth of ~17% p.a. are accelerated trends of urbanization, infrastructure development, increasing economic wealth, technology enhancement etc. which could lead to rise in demand for high performance products/ processes. The extent of accelerated trend could result in varying scenarios. A faster implementation of PCPIRs will also provide backward linkage in production support to facilitate high growth case.

4. Opportunities

Specialty chemicals segment has immense growth potential driven by high growing end-use industries. Technology & innovation will play vital role in growth of this sector where India has natural advantage of large pool of technical man-power as well as scientists and researchers.

Some of the upcoming developments that support the growth story for specialty chemicals are:-

- a. Setting up of PCPIRs
- b. Up-gradation of technical university to manage talent scarcity
- c. Setting up of TUF (Technology up-gradation fund)
- d. Increased focus on establishing consumer standards, environment protection certification etc.

However the execution of these initiatives is likely to define the rate of growth of specialty chemicals market.

5. Export - Import scenario

a. Export: Key markets and key products

India exports significant proportion of its production of specialty chemicals and API. The key markets for export of specialty chemicals are (Refer Figure III 4):-

Figure III 4: Key export destinations for specialty chemicals



- | | |
|-------------|-----------------|
| i. USA | viii. Korea |
| ii. Germany | ix. Indonesia |
| iii. UK | x. Pakistan |
| iv. Turkey | xi. Thailand |
| v. Brazil | xii. Bangladesh |
| vi. Italy | xiii. Japan |
| vii. China | |

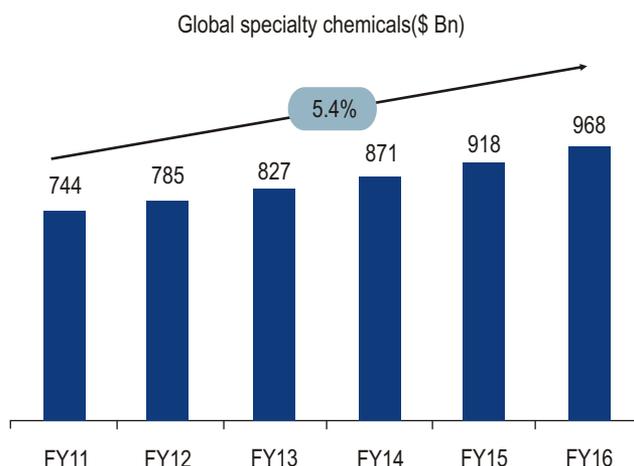
Colorants (dyes and pigments) form the bulk of the export of specialty chemicals. Agrochemicals export is also on the rise and major destinations for agrochemical exports are US, UK, France, Netherlands, Spain, Belgium and Asia-pacific countries. API exports from India are into both regulated and semi regulated markets spanning across the world.

Most of the export is either to the near-by Asia-pacific regions which have downstream usage of these specialty chemicals but minimal domestic manufacturing or to the developed countries in Europe and USA which import from India for their manufacturing competitiveness.

b. Future global scenario

Currently in FY11 the global market is ~\$740 billion and going ahead it is expected to grow by ~5.4% p.a. to reach ~\$970 billion by FY16 (Refer Figure III 5). Bulk of the global demand growth is expected to be driven by Asia-pacific countries and Middle Eastern countries which have currently lower levels of consumption.

Figure III 5: Projected global market size of specialty chemicals, \$ Bn



Increasing global demand is most likely to result in increased production by low cost manufacturing locations of Asia-pacific. At present India, exports to most of the Asia-pacific countries and other developed countries of Europe and USA. Going ahead India's exports is likely to increase further as many of the nearby countries don't have competitive capacities while developed countries are likely to prefer India over China as sourcing destinations.

In comparison to China, India has balanced IPR regime with good talent pool. Indian legal system is good and is expected to provide confidence to foreign investors. These along with good labour laws, low R &D cost and also low cost of capital could push India as a more preferred destination for setting up manufacturing units.

c. India's competitive manufacturing

Increasing globalization has resulted in diminishing of geographic boundaries for business and the trade has been increasingly on the rise. Globally, Asia- pacific countries have gradually become the key suppliers for bulk of the chemical products. India's manufacturing competitiveness makes it one the preferred suppliers for most countries. The key factors contributing to India's manufacturing competitiveness are:-

- a) Demographic dividend: India's percentage of working population has been on the rise and is expected to grow up to ~67% by 2030 from current levels of ~63%. While the percentage working population has started to dip for countries like China and Japan.
- b) Availability of skilled labour force with low wage rates
- c) Increased government focus on promoting manufacturing sector through Special Economic Zones, Petroleum, Chemicals & Petrochemical Investment Regions (PCPIRs), National manufacturing investment zones (NMIZs) by providing fiscal benefits

The new manufacturing policy of government validates its intent by establishing a target to increase share of manufacturing in GDP from current 15% to 25% by 2022.

d. Potential for chemical hubs in India

Establishment of PCPIRs is of immense importance for chemical industry as the policy is expected to attract major investments, both domestic and foreign for chemicals. Three PCPIRs have already been notified (Dahej, Paradip and Vizag). In addition to this various SEZs have presence of petrochemical complex (Mangalore and Dahej). These SEZs have a commitment to be a net foreign exchange earner making their focus strong for accessing export markets.

6. PCPIR policy

Petroleum, Chemicals and Petrochemicals Investment Region (PCPIR) is a specifically delineated investment region with an area of around 250 square kilometers planned with the establishment of manufacturing facilities for domestic and export led production in petroleum, chemicals and petrochemicals, along with associated services and infrastructure. It is a flagship scheme of Department of Chemicals and Petrochemicals started in 2007.

PCPIR policy was expected to attract major investments, both domestic and foreign in the petroleum, chemical & petrochemical sectors. The nodal agency for PCPIRs is the Department of Chemicals & Petrochemicals (DoC&PC). The policy objective is to promote investments and make India an important hub for both domestic and international markets by leveraging India's low cost manufacturing capability.

PCPIR constituents

A typical PCPIR would comprise of production units, public utilities, logistics, facilities for environmental compliance, residential areas and administrative services. It would have a processing area, where the manufacturing facilities, along with associated logistics and other services, and required infrastructure will be located, and a non- processing area, to include residential, commercial and other social and institutional infrastructure. The PCPIR may also include one or more SEZs, Industrial Parks, Free Trade & Warehousing Zones, Export Oriented Units, or Growth Centers, duly notified under the relevant Central or state legislation or policy.

Each PCPIR would have a refinery/ petrochemical feedstock company as an anchor tenant. The internal infrastructure within the PCPIR will be built and managed by a Developer, or a group of Co-developers. The external linkages will be provided by Government of India and the concerned state governments. The users, i.e. industrial units located in the PCPIR, of external and internal infrastructure will pay for its use, except to the extent that the government supports the service through budgetary resources.

Role of the government

Government of India will ensure the availability of external physical infrastructure linkages to the PCPIR including Rail, Road (National Highways), Ports, Airports, and Telecom, in a time bound manner. The infrastructure would be created/upgraded through Public Private Partnerships to the extent possible. Central Government would provide necessary viability gap funding through existing schemes as well as make requisite budgetary provisions for creation of these linkages through the public sector.

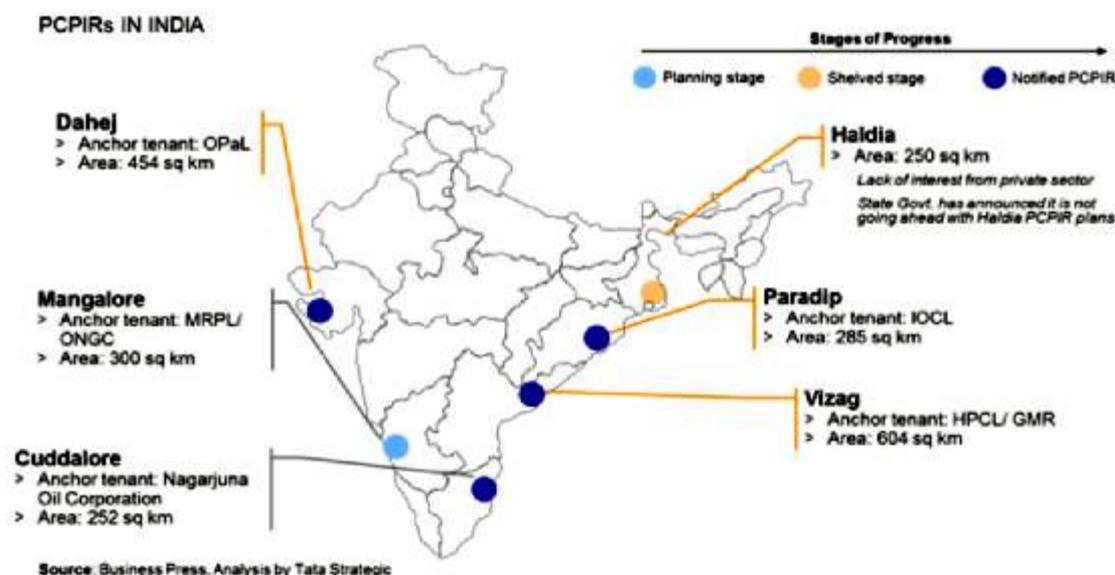
The State Government's responsibility includes all physical infrastructure and utilities linkages under its jurisdiction, identifying a nodal Department, for coordination of these linkages, facilitating all clearances required from the State Government. This is becoming a major challenge in implementing PCPIR in time bound manner.

PCPIRs in India

India has identified six PCPIRs, out of which four have been given final notification.

The Haldia PCPIR plan has been shelved as the new government of West Bengal is not supporting it. However, unlike Haldia, there have been no opposition from any faction of the society for the other four PCPIRs and their progress is expected to go on as planned. Vizag, Paradip and Dahej are the PCPIRs with some development whereas Cuddalore PCPIR has been approved recently in August 2012.

Figure III 6: PCPIRs in India



In Dahej, the total investment already committed stands at Rs 128441 cr. Investment of anchor tenant (ONGC-Opal) is Rs 8707 cr., as on May 2012. EIA Study & Environment management plan has been assigned to NEERI. 6 laning of Bharuch to Dahej stretch is being undertaken by Gujarat Govt. However the anchor tenant lies within the SEZ and hence has to be mostly export focused.

Major issues in implementation

Till date Government of India has approved 5 PCPIRs in Gujarat, Andhra Pradesh, West Bengal, Tamil Nadu and Orissa of which West Bengal has dropped the proposal. Difficulties of land acquisition and creating infrastructure had been major hurdle in implementing these projects. The issue of feedstock for downstream industry to the PCPIR's mother unit is also a contentious issue. While the anchor units are yet to fully configure the projects, except OPAL's Dahej unit, there is yet to be a firm downstream plan for bulk and specialty chemicals. Allocation and pricing for supply to downstream unit from the mother anchor unit are major issues in the absence of any viable business model in Indian context.

The largest potential risks to the success of PCPIRs have been the FDI availability and feedstock security. Delays owing to global economic crisis and subsequent international shortage of FDI have derailed the growth track. Despite increasing gas availability due to new find and LNG; feedstock availability and security still remains a concern. Further delays and issues in land acquisition and inadequately meeting environmental concerns can disrupt the mega investment plans.

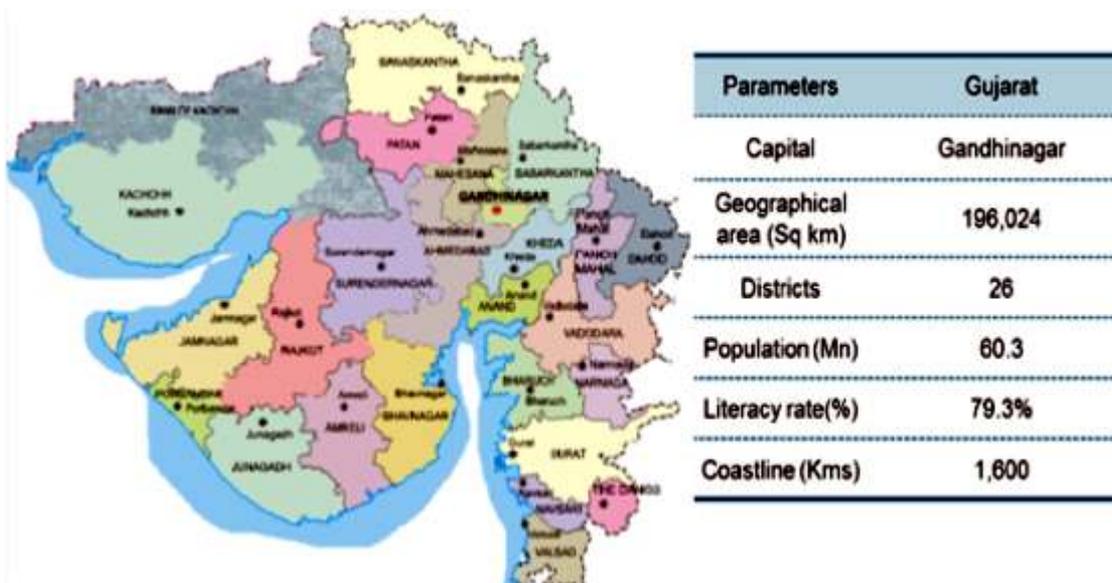
Conclusion & Recommendation

In conclusion, PCPIRs can deliver economies of scale to close the cost gap and make Indian producers more competitive. PCPIRs can be the proverbial 'Philosopher's Stone', providing world class infrastructure facilities at lower costs and also tremendous business potential and growth to the petrochemical players. However certain steps should be taken in order to achieve these. The likely steps could be (based on the discussions in the FICCI National Chemical Committee meetings):

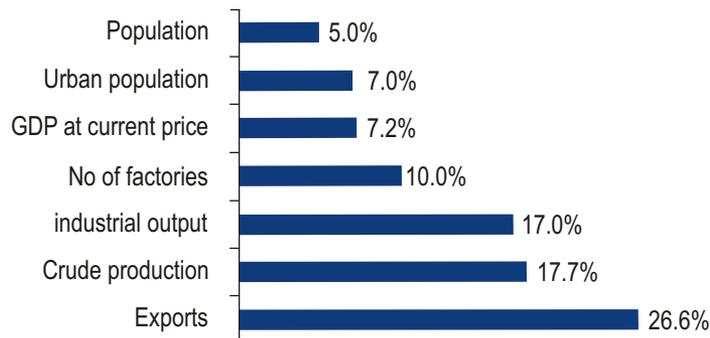
- a. A consortium cracker approach may resolve the feedstock issue for downstream units from the mother cracker in the PCPIR. Government can play a facilitative role in bringing potential downstream investors through a workable business process
- b. The anchor unit could announce the cracker and call bids for its products from potential downstream units on a long term supply contract. This would ensure assured supply of feedstock to downstream units
- c. Pricing of products between upstream and downstream units need to be transparent and market driven
- d. Feedstock to the mother unit like naphtha, propane, butane, LPG, reformatate should be at zero level of import duty to make such arrangements economically viable
- e. Reasonable duty spread between feedstock to the mother unit and output for the downstream would be necessary to make large investment required in the mother unit attractive.
- f. Import duty on finished products from downstream unit should be at peak level to make the entire value chain economically viable.
- g. Adequate tax and fiscal incentives may be devised for anchor unit / consortium cracker to make the unit economically viable.
- h. All state level taxes and duties need to be rationalized

IV. Gujarat state advantage

Over the years, Gujarat has become one of the most preferred locations for industrial investment in India. Apart from having sound infrastructure facilities, skilled manpower, excellent domestic and international connectivity and availability of raw materials, a key differentiating factor for Gujarat is its focus on industrial development in the state. It has evolved as an urbanised economy ensuring easy off-take of industrial output. The figure below lists the map & key parameters of Gujarat.



Gujarat has achieved an annual growth rate of ~10 % p.a. over the past five years and contributes ~17% to the industrial production of the country.

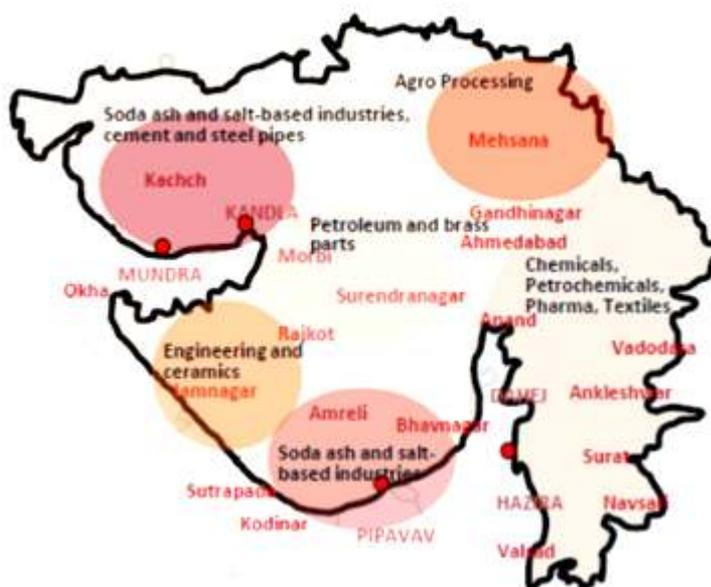


In 2010-11, Gujarat contributed 24.6 per cent to India's total exports of goods. Exports include products from sectors such as textiles, petroleum, chemicals, pharmaceuticals, engineering, gems and jewellery, naphtha, petrol, clinker, cement, oil cakes, bauxite, paraxylene, salt, soda ash, food grains, cement clinker, ethylene, Pet-cock etc. The total cargo handled by the Kandla Port (Only Major port of Gujarat) was 82.5 million tonnes during 2011-12. Gujarat is also the largest exporter of cotton (60%) in the country.

The industrial infrastructure of Gujarat is very supportive for business development. The state's manufacturing industry is supported by 0.34 million MSMEs. Currently, Gujarat has 83 product clusters (refer figure below). The Cluster Development Scheme has been launched for furthering the growth of product clusters. Some of the successful clusters include ceramics cluster at Morbi, brass-parts cluster at Jamnagar, fish processing cluster at Veraval and power-looms cluster at Ahmedabad. Gujarat has 184 industrial estates established by the Gujarat Industrial Development Corporation (GIDC) for specific sectors such as chemicals, electronics, gems, apparels and granite. The State Government has taken care to set up industrial estates on non-agricultural land after assessment of industrial viability. Such availability of product cluster ensures opportunity across the value chain.

The chemical and petrochemical industry in Gujarat is the fastest growing sector in the state's economy. Gujarat is the 'Petro Capital' of India, and contributes significantly to the country's petrochemicals production (62 per cent), chemicals production (51 per cent) and pharmaceuticals production (35 per cent). Gujarat has truly emerged as the hub of chemical manufacturing in India. Around 6,600 chemical and petrochemicals products are produced in the state.

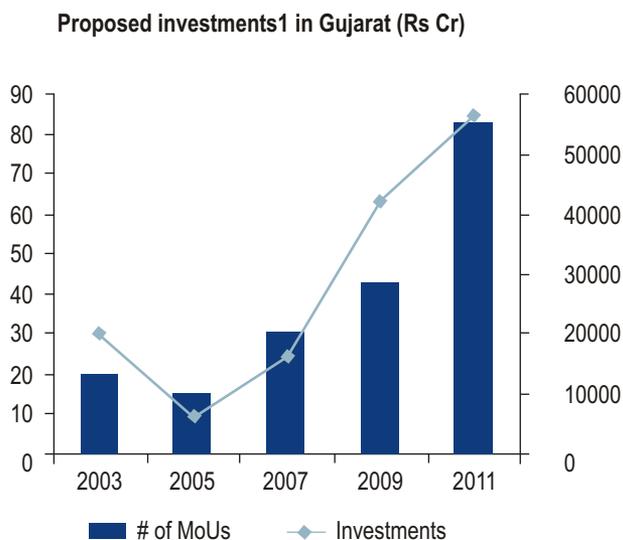
Key product clusters



Gujarat houses production facilities for some of the largest global and Indian chemical and petrochemicals manufacturers. Gujarat State Fertilizers & Chemicals Ltd. (GSFC), Gujarat Alkalis & Chemicals Ltd. (GACL) and Gujarat Narmada Valley Fertilizers Company Ltd. (GNFC) are the largest public sector units located in Gujarat. GSFC is the only producer of melamine and largest producer of caprolactum in India. GACL is the market leader in caustic soda whereas GNFC is one of the leading fertilizers company in the country. Apart from these 3 PSUs, a large number of domestic and multinational companies across various chemical segments have presence in the state. Leading Indian and multinational private organizations which have a footprint in Gujarat are Reliance, ONGC, Dow Chemicals, Cheminova, Lanxess, India Oil (IOCL), Indian Petrochemical Corporation Limited (IPCL), Nirma, Essar, BASF, Bayer, Rallis, Novartis, Cadila, Aarti Group and Deepak Nitrite. Gujarat accounts for ~35% of India's pharmaceutical output with more than 3200 pharmaceutical companies located in the state. More than 35% of large & medium units in the state are from chemical industries and chemicals account for ~16% of employment in the state.

Investment climate in Gujarat

A key indicator of investor and industry confidence in Gujarat is the number and scale of investments and business ventures committed to the state. About 7,936 memorandums of understanding (MoUs) were signed for INR 20,83,000 crore (\$ 450 billion) at Vibrant Gujarat Summit 2011. Out of that more than 80 MoUs and announcements were signed in the Vibrant Gujarat summit 2011 for projects to be executed and established in the chemical and petrochemical sector. The cumulative proposed investment in the sector stood at more than INR 56,000 crore (\$11 billion). Most projects are for establishing industrial parks and production plants for base chemicals, specialty chemicals and dyes and intermediaries.



Source: Vibrant Gujarat, 2011

Note: 1 In chemical & petrochemical sector



The sustained economic success and rapid industrial growth have been made possible by an unambiguous pro-industry approach by the State. Several policy decisions, execution of key projects and geographic and demographic factors have helped increase the ease of doing business in Gujarat, specifically in the chemicals industry.

Infrastructure and strategic location

Gujarat is well connected by the Indian Railways network and has built one of the best road networks in India. It's a power-sufficient state with a low cost of utilities and one of the highest per capita power consumption levels. It has the highest number of airports and second highest number of ports in India. It's the only state with an integrated state-wise gas grid and has a very high tele-density. Also, the Sardar Sarovar Narmada project, once completed, is expected create continuous water supply throughout the state. Gujarat is favourably located midway between the highly industrialized Delhi-Mumbai corridor, giving it ease of access to high-growth states in North and West. The state has the longest coastline in the country (1,600 kms) and is well-connected to major trade routes to Europe, Middle-East, East Asia and Australia through a large number of ports. 38% of the proposed Delhi Mumbai Industrial Corridor will pass through Gujarat, thereby providing the opportunity for chemical companies to base their production in Gujarat and serve the Indian market.

Raw material availability

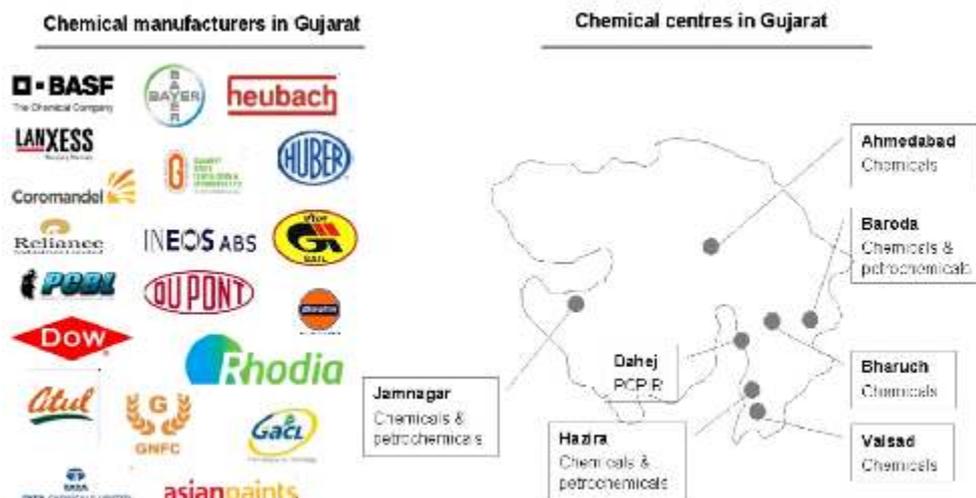
Rich availability of natural resources and basic feedstocks facilitate production of a large number of downstream chemical products. Availability of limestone, salt, petroleum and natural gas make Gujarat a leading manufacturer of basic chemicals (e.g. caustic soda, caustic potash), petrochemicals (e.g. polymers, PE/PP/PVC) and fertilizers (e.g. urea, bio-fertilizers).

Availability of talent

Gujarat has always been well known for its entrepreneurial talent who have spread their footprint nationally and across the globe. Additionally, over 45 government and private management institutes provide a pool of business administration talent. Moreover, there are ~40 engineering colleges teaching chemical engineering and ~50 polytechnic institutes offering courses focused towards the chemicals sector. Overall, Gujarat offers a world-class pool for talent in entrepreneurship, business administration and engineering, which could be easily tapped by the industry.

Impetus for growth: Integrated development and PCPIR

The presence of mega-estates in chemical manufacturing at several industrial clusters in the state has helped growth and expansion of the industry by providing an appropriate business ecosystem. Chemical clusters especially at Ankleshwar, Panola, Vapi, Vatva, Jhagadia, Vilayat and Dahej facilitate rapid development and growth.



Source: Secondary research, Analysis by TATA Strategic

DAHEJ PCPIR:

The PCPIR at Dahej, southern Gujarat is spread across a notified area is 453 sq km and it has received formal approval from DoC&PC in March 2009.

Existing infrastructure

The Dahej PCPIR enjoys proximity to Gujarat Chemical Port Terminal Company Limited (GCPTCL) and LNG port and access to Delhi - Mumbai Broad Gauge railway line at Bharuch. A 50-km of four-lane Dahej-Bharuch State Highway connects six lane Delhi-Mumbai National Highway & Expressway.

Investments - Planned and realized

As of June 2011 ~80% of the planned investments in Dahej PCPIR have been realized and accounting for \$ 16 Bn out of a total committed investment of ~\$ 20 Bn. Approximately 70% of the land development is complete and an infrastructure investment of \$ 1.7 Bn is proposed. Also, Dahej PCPIR is notified under the rules for special investment zones with several tax-related advantages extended to incoming investors.

Upcoming external infrastructure

External infrastructure is being developed to ensure excellent connectivity (sea, road, rail and air) to Dahej PCPIR:

- Ports: 40 MnTPA Solid & Liquid Cargo and Container Port with investment of \$300 Mn; Container Feeder Terminal (10000 TEU) to Pipavav and Marine Shipbuilding Park by GMB
- Roads: Ahmedabad-Baroda National Expressway to be extended to Mumbai (PCPIR loop planned); six-laning of Dahej-Bharuch road; upgradation of 8 km of port linkage & four-laning of 42 km of State Highways within PCPIR; construction of 25 km of coastal roads

Major players at Dahej PCPIR

Greenfield



Existing



- Air: Greenfield airport for PCPIR; airstrip at Ankleshwar
- Rail: Broad gauge conversion of Bharuch-Dahej rail line (62 km); connection with Delhi-Mumbai Dedicated Freight Corridor (DFC)

Support for micro, small and medium enterprises

Gujarat state government, since 2000, has adopted a policy of supporting SMEs. Some of the features mentioned could be favorably capitalized by existing companies and new entrants in the chemical industry:

- 5% interest subsidy on loans for modernization programmes
- Interest subsidy on eligible parameters, e.g. sector, size, etc.
- Venture capital and patent monetization assistance
- Technology acquisition fund
- Support for vendor development
- Support for auxiliary industries for value-addition
- Cluster development in PPP mode
- Rehabilitation of sick units

With the existence of conducive business environment, presence of leading companies, availability of a strong talent pool, entrepreneurial culture and strong policy support by the State Government, Gujarat is poised to retain and further build on its leadership position in India's chemical industry going forward.

1. Specialty chemicals in Gujarat

For the growth of any specialty chemicals company two aspects of value chain are very critical:

- i) Need & presence of end consumers
- ii) Availability of feedstock

Amongst all states of India, Gujarat is one of the fastest growing states in terms of urbanization. Its urbanization has increased from 37% to 43% in last decade. As explained earlier, Gujarat accounts for ~5% of total population whereas in terms of urban population its share is ~7% (2% higher than share of overall population). The demands of these urban users are more towards performance & high value added products. This makes Gujarat market a ripe market for consuming specialty chemical products. One of the key segments of specialty chemical is agrochemicals. Gujarat as a state faces food security challenge. And hence the need to increase the yield is quite high. This makes it a good focus market for agrochemicals. Another example for the site specific need of Gujarat is for water treatment chemicals. Gujarat is an industrial state with the water availability already in scarce zone. This has increased the significance of water conservation & hence increased the scope of water treatment chemicals.

Being an industrial state the perception of chemical industry is not so bad in Gujarat. In addition Gujarat govt. has planned effectively in recent past to ensure environmental safety & communication of the same to its citizens. The presence of downstream industries is huge, based on favorable investment policies of govt. in the past. Gujarat accounts for ~10% of the total industries in India. The entrepreneurial spirit of Gujarat is well acclaimed & hence a lot of small & medium enterprises could also be found here.

For feedstock availability, Gujarat alone accounts for more than 40% of the refining capacity in India. And with RIL & OPaL crackers the availability of raw materials should not be a major concern. However the challenge for the availability still remains, as the fragmented structure of specialty chemical producers does not guarantee a regular off take for crackers. This makes feedstock for specialty chemical a low priority in their product portfolio.

Apart from these another major hindrance for growth of specialty chemical is technology. The level of R&D in Gujarat is limited (in comparison to India it is still better). However going ahead with many foreign MNCs increasing their presence & govt. promoting industry academia linkages, Gujarat is likely to overcome this hurdle also.

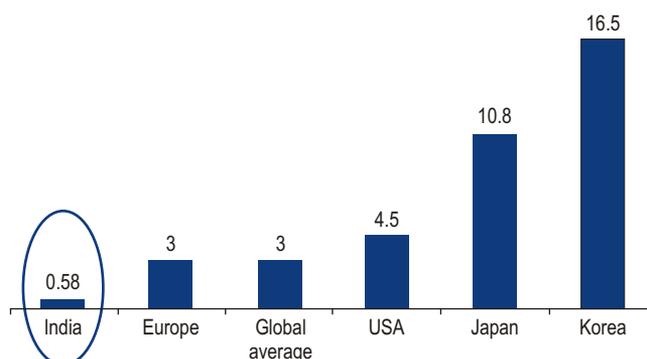
V. Industry reports

1. Agrochemicals

Introduction

In India a high spent on food and being the largest employer status makes agriculture a significant part of economy. Agriculture even though accounts for only ~17% of GDP it employs 55-60% of the workforce. However Indian agriculture is faced with challenges like limited farmland availability and low crop yields. India's crop yields in major crops like Rice, lentils, corn and soya-bean is more than 50% below China's. And one of the major reasons for this has been the low average crop protection consumption in India. (Refer Figure V 1)

Figure V 1: Average crop protection consumption (Kg/ Ha)



Source: Industry reports, Meeting of the GOI Chemicals Task Force-Crop protection sub sector discussions, Tata Strategic Analysis

The primary reason for low usage could be attributed to:-

- Low purchasing power of farmers
- Lack of awareness among farmers regarding benefits of crop protection chemicals
- Reach and accessibility of products
- Fragmented land holdings and low levels of irrigation
- Dependence on monsoon

Agrochemicals are used to improve crop performance, yield or control pests, etc. Agrochemicals are substances manufactured through chemical or biochemical processes containing the active ingredient in a definite concentration along with other materials which improve its performance and increase safety. For application, these are diluted with water in recommended doses and applied on seeds, soil, irrigation water and crops to prevent the damages from pests. There are broadly 5 categories of crop protection products: Insecticides, fungicides, herbicides, bio pesticides and others (includes nematocides, rodenticides etc.).

Market overview

Currently, the crop protection chemicals/ agrochemical accounts for ~3.5% of the total chemicals market in India. The domestic crop protection market is estimated at ~\$2 Bn, whereas the exports market is estimated at ~\$1.8Bn making its total market size of \$3.8Bn.

The crop protection industry in India is generic in nature with ~80% of the molecules being non-patented. Hence, strong distribution network and brand image act as competitive factors. Crop protection chemicals are manufactured as technical grades and converted into formulations for agricultural use. The crop protection industry consists of technical grade manufacturers, formulators producing the end products, distributors and end use customers. According to Pesticide Monitoring Unit, GOI, there were about 125 technical grade manufacturers, including about 10 multinationals, more than 800 formulators and over 145,000 distributors in India in 2007. Over 60 technical grade pesticides are being manufactured indigenously.



Technical grade manufacturers sell high purity chemicals in bulk (generally in drums of 200-250 kgs.) to formulators. Formulators, in turn, prepare formulations by adding inert carriers, solvents, surface active agents, deodorants etc. These formulations are packed for retail sale and bought by the farmers.

Insecticides form the largest segment of the domestic crop protection chemicals market accounting for 55% of the total market. It is mostly dependent on rice and cotton crops. Herbicides are the largest growing segment and currently account for 20% of the total crop protection chemicals market. Sales are seasonal, owing to the fact that weeds flourish in damp, warm weather and die in cold spells. Rice and wheat crops consume the major share of herbicides. Increasing cost of farm labour will drive sales of herbicides going forward. Fungicides, accounting for 20% of the total crop protection market, are used for fruits and

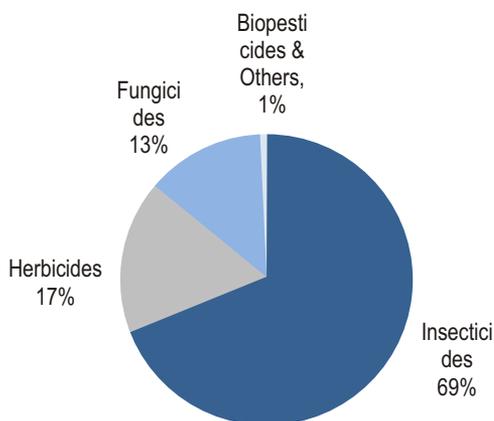
vegetables and rice Farmers moving from cash crops to fruits and vegetables and government support for exports are increasing the fungicides usage. Bio-pesticides include all biological materials organisms, which can be used to control pests. Currently a small segment, bio-pesticides market is expected to grow in the future owing to government support and increasing awareness about use of non-toxic, environment friendly pesticides.

With increasing penetration of BT cotton, usage of insecticides has witnessed a decline in the recent past. Its share in the total crop protection chemicals has reduced from 69% in 2004 to 55% in 2011. On the other hand, share of herbicides and fungicides has increased from 17% and 13% respectively in 2004 to 20% each in 2011 (Refer Figure V 2). This is due to increased focus on fruits and vegetables and higher awareness levels among end users.

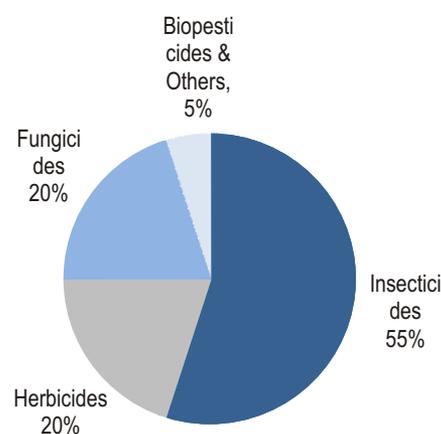
the major players in agrochemicals in India are Bayer, Rallis, United Phosphorus, Syngenta etc.

Figure V 2: Market distribution of agrochemicals by product category

Market distribution by product category FY04



Market distribution by product category FY11

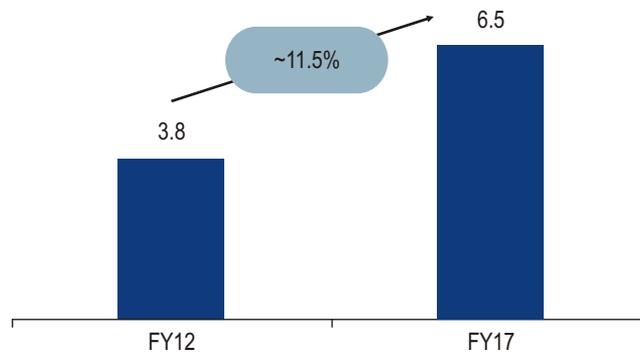


Source: Industry reports, Tata Strategic analysis

Future growth potential

Even though the Indian agricultural sector is highly dependent on monsoons, the market for agrochemicals is expected to grow at a rapid growth rate of ~11.5% p.a. to reach \$6.5 Bn by FY17 (Refer Figure V 3).

Figure V 3: Future growth potential of agrochemicals, \$ Bn



Source: Industry reports, Research by Tata

Key growth drivers include:

1. **Increasing demand for food grains:** India has 16% of the world's population and less than 2% of the total landmass. Increasing population and high emphasis on achieving food grain self-sufficiency is expected to drive growth.
2. **Limited farmland availability:** India has ~190 Mn hectares of gross cultivated area and the scope for bringing new areas under cultivation is severely limited. Available arable land per capita has been reducing globally and is expected to reduce further. The pressure is therefore to increase yield per hectare which can be achieved through increased usage of agrochemicals.
3. **Low Productivity:** India has low crop productivity as compared to other countries. Average productivity in India stands at 2 MT/ha as compared to 6 MT/ha in USA and world average of 3 MT/ha. At the same time, India's pesticide consumption is also low at 0.60 kg/ha as compared to the world average of 3 kg/ha. (Source: India stat, Industry reports) Hence, increased usage of pesticides could help the farmers to improve crop productivity. By educating farmers and conducting special training programs regarding the need to use agrochemicals, Indian companies can hope to increase pesticide consumption.
4. **Growth of horticulture and floriculture:** Buoyed by high growth experienced by Indian floriculture industry, Government of India has launched a national horticulture mission to increase production (Source: National Horticulture Mission) Growing horticulture and floriculture industries will result in increasing demand for agrochemicals, especially fungicides.

5. Growth of plasticulture: Enhancing agricultural productivity to meet growing demand for food and achieving food security for the entire population is one of the key objectives of the country. Plasticulture include soil fumigation film, irrigation drip tape/tubing, nursery pots and silage bags, but the term is most often used to describe all kinds of plastic plant/soil coverings. Such coverings range from plastic mulch film, row coverings, high and low tunnels (polytunnels), to plastic greenhouses. The rise of this segment will lead to increased innovation & development of different usage avenues for specialty chemicals in agriculture.

2. Fine chemicals

Introduction

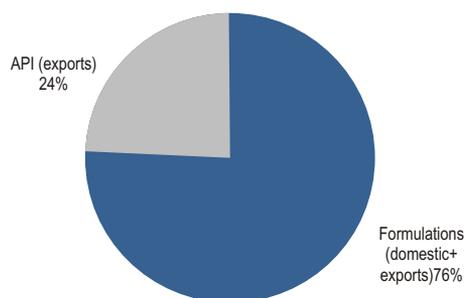
Fine chemicals or Active Pharmaceutical Ingredients (APIs) are integral components of both the quality and the cost of pharmaceutical goods. Pharmaceutical are one of the key necessities for public and this requires that API players must account for high quality, sustainability and low prices. Driven by lower costs and high quality (requires skill set and R&D also) the manufacturing of APIs have gradually moved to manufacturing competitive countries of Asia-pacific like China and India. Mostly for generic drugs the cost competitiveness becomes the key and as going ahead by 2014 almost \$3Bn worth of drugs are going off patent this increases the potential for API manufactures in India drastically.

Market overview

Indian players are also increasingly involved in providing API for regulated markets. Players such as Piramal Healthcare, Divi's Labs, Dishman Pharma, Shasun and Aurobindo etc. supply API for patented products to large and mid-sized pharmaceutical players in regulated markets.

The total turnover of pharmaceutical segment in FY10 was ~\$21.8 billion .Details of the overall market size are given below (Refer Figure V 4). The market break up is such that the of the total pharmaceutical segment API exports account for ~24% of the total turnover resulting in a market size of ~\$5.3 Billion. Rest \$16.5 Billion is captured by formulations.

Figure V 4: Indian Pharmaceutical Segment, FY10



The Pharmaceutical market FY10:~\$21.8Bn

Source: Department of Pharmaceuticals Annual Report 2010-11 Research by Tata Strategic

The API exports and the consumption of API for domestic formulations together account for a market size of almost \$8.1 billion in FY10 with the API domestic consumption accounting only for ~35% of the total production (\$2.8 Bn). There has been growth in the export of the API as the market is estimated to grow from ~60% of total production in 2008-09 (Source: Indian Pharmaceutical Industry, 2009 & ICRA) to ~65% in 2009-10. This trend is also evident from the rising number of deals by Indian players for supplying API in recent years. List of some of the deals is given below (Refer Table V 1):-

Indian company	MNC partner	Deal type
Piramal healthcare	AstraZeneca Allergan Pfizer	Several APIs two APIs some APIs
Divi's Labs	Abbott Labs GSK Merck & Co.	N.A. two APIs one API
Dishman	Solvay AstraZeneca GSK	four APIs one API some APIs
Shasun Chemicals	GSK Eli Lilly	one API one API
Cadila Healthcare	Nycomed Wyeth	one API one API
Alembic	Pfizer	one API
Hikal	Pfizer Apotex	one API one API
Aurobindo Pharma	Pfizer	Several APIs
Matrix Labs	Mylan	Acquisition
RAKS Pharma	Amneal Pharma	Acquisition

Over the past few years, Indian pharmaceutical players have been increasingly tapping opportunities in global generics markets, especially the US and Europe. Medium-sized and small players, meanwhile, have targeted the semi-regulated markets of Africa, Asia and Latin America to enhance their distribution network. Also cost involved for approvals and the hassles of regulated market has acted as impediments for medium and small players.

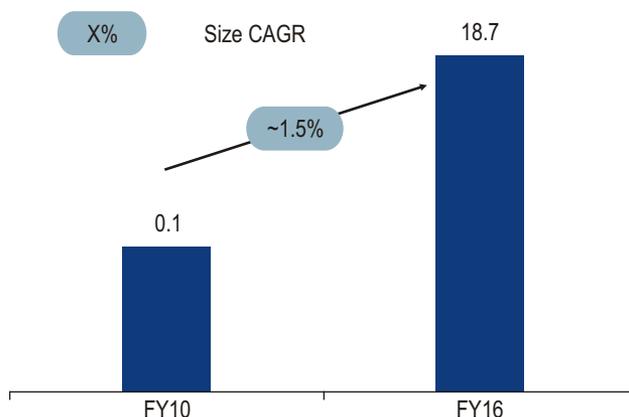
Buoyed by the above trends, For API manufacturers, a burgeoning generic market and cost-reduction measures by global pharmaceutical companies present a huge opportunity in regulated markets. India, which has lower manufacturing costs, well-developed process chemistry skills and the largest number of drug master filings globally, is well-placed to tap export opportunities in regulated markets. Accordingly, bulk drugs exports have grown posted a robust CAGR of over 25% between FY06 and FY10, with exports to regulated markets (having an estimated 52 per cent share) registering a CAGR of about 35 per cent in the said period.

Typically large players are more profitable due to their wide base in regulated markets, which fetch higher realizations. However, a significant exposure to international markets also makes large players vulnerable to risks such as currency volatility, overall market performance and outsourcing plans of key players in the target destinations etc.

Future growth potential

The overall market of API is expected to grow at ~16% p.a. in the next five years to reach ~\$17 billion by FY16 from current levels of \$8.1 Billion (Refer Figure V 5).

Figure V 5: Market size of API (including exports), \$ billion



The global pharmaceutical industry is witnessing a strong generics push, as drugs totaling annual revenues of around \$150 billion will go off-patent during FY11 to FY15. Additionally, declining revenue growth due to a fall in the prices of drugs and decreasing research and development (R&D) productivity (despite an escalation in drug development costs) has forced big pharmaceutical players to cut costs and outsource manufacturing of API to cheaper destinations like India.

These developments have provided Indian API manufacturers an opportunity to increase their penetration in the US and Europe generics market. API exports for off-patent drugs are expected to grow at a CAGR of 17-19% over the next 5 years. Also driving exports will be the decline in the profitability of global players due to severe competition in the space. The emphasis on reducing healthcare costs by governments of regulated markets will give a further fillip to generics and in-turn API export.

In terms of low cost, China is more preferable over India, however still global players prefer India because of documentation issues (language of documents), quality concerns, and India's advanced process chemistry skills. Also, India has the highest number of US FDA (US Food and Drug Administration) approved facilities outside the US. In the case of some players, forward integration into pre-formulations is also provided by Indian manufacturers.

India accounts for nearly 35 per cent of Drug Master Files of the total drug master filings (DMFs) to the US FDA, the share of Indian players has risen sharply to about 35 per cent in 2010 from about 14 per cent in 2000. 271 DMFs in 2009 and 311 DMFs in 2010 were added. This suggests that Indian players have been able to maintain the required quality standards to export to regulated markets. (A DMF provides an indication about the bulk drug manufacturing capabilities of players in terms of its quality standards at facilities, processing, packaging, storage of drugs etc. to the global pharmaceutical company who is outsourcing). Sizeable gap exists in the DMFs of India in comparison to competing countries like China (12%) and Japan (5%).

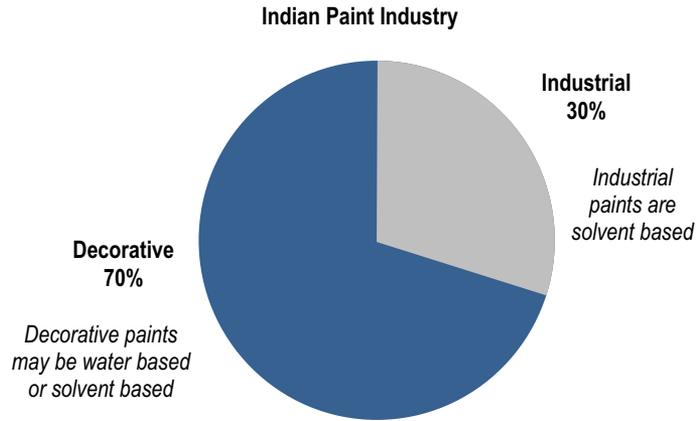
Hence for API export which is one of the critical elements in value chain, India's manufacturing competitiveness is most likely not threatened.

3. Paints, Coatings & Construction chemicals

Introduction

Paints & Coatings: India is one of the major participants in the global paints and coatings industry. The industry can be broadly classified into 2 segments (Refer Figure V 6)

Figure V 6: Segments of Indian Paint industry



Decorative Paints: This segment primarily caters to the residential and commercial buildings and accounts for 70% of the total paint industry. Enamels are the most widely used followed by distempers and emulsions. Interior and exterior paints account for 75% and 25% of the decorative paints respectively (Refer Figure V 7). On the basis of product composition, decorative paints are of two kinds - water based and solvent based.

Industrial paints: This segment includes paints used in automobiles, auto ancillaries, consumer durables, containers, etc. (Refer Figure V 8). This segment requires technological expertise and therefore it is largely served by the organized sector. It accounts for 30% of the overall market.

Figure V 7: Segments- Decorative paints

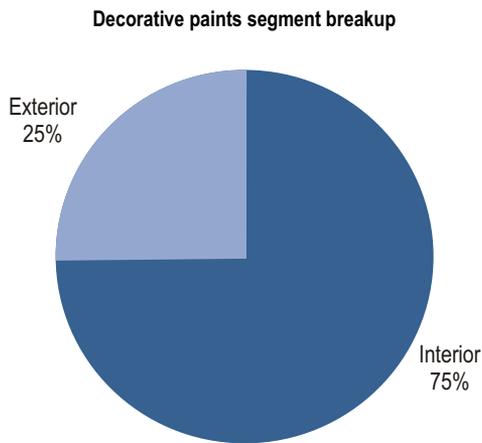
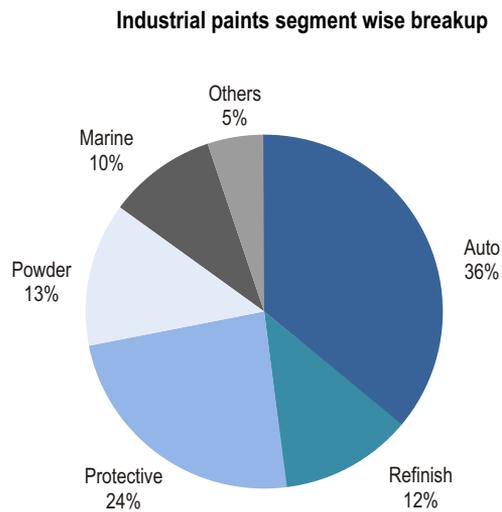
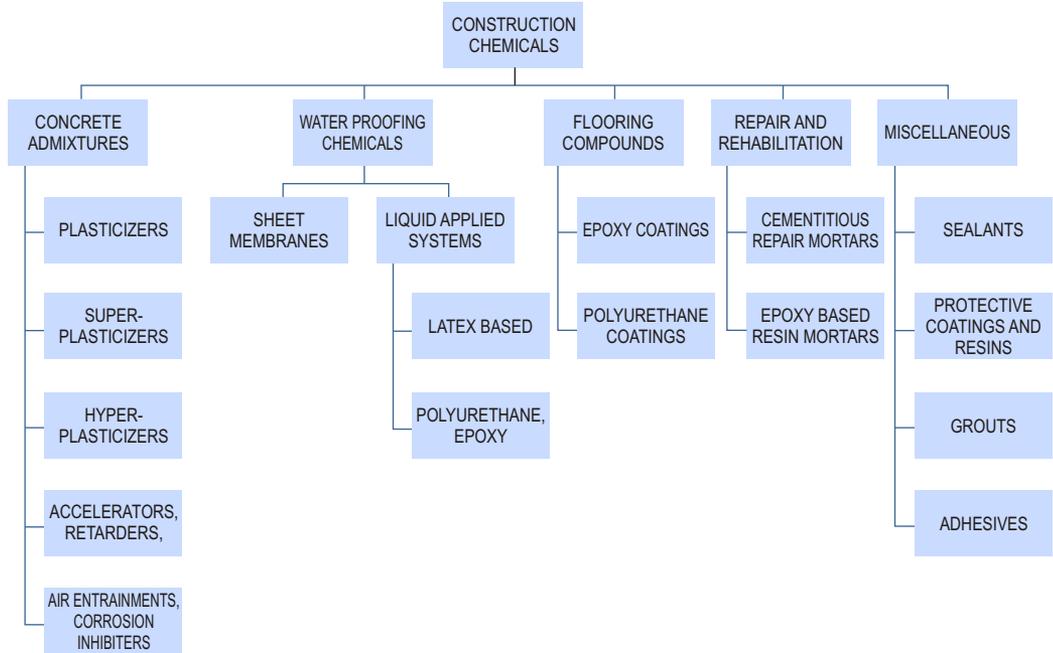


Figure V 8: Segments - Industrial paints



Construction Chemicals: Construction Chemicals are the chemical compounds used in construction activities. These compounds can be used in existing construction projects to speed up the construction work or in new construction projects to impart durability and strengthen the structures. Construction chemicals increase the cost of the project by 2-5% but the benefits are multi-fold. Certain chemical products help in minimizing the quantities of cement and water used in the construction. Based on end use applications, these compounds can be broadly classified into five categories.

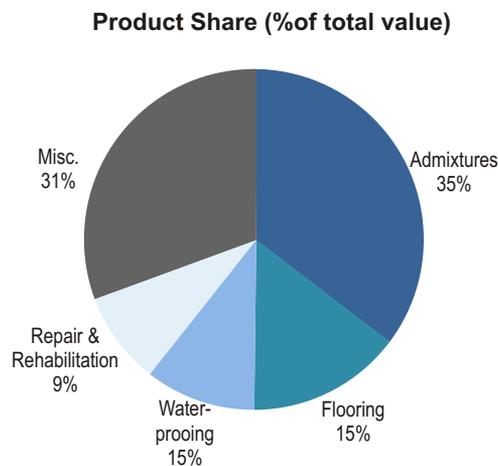




These compounds impart chemical as well as physical properties in applications such as cross-linking or phase change (from liquid to solid). They also increase the life of construction work and impart additional protection from environmental hazards.

In 2011, concrete admixtures accounted for 35% of the total construction chemicals market, while flooring and waterproofing chemicals had a share of 15% and 10% respectively (Refer Figure V 9). Other segments include sealants, grouts and adhesives.

Figure V 9: Segments-Construction Chemicals



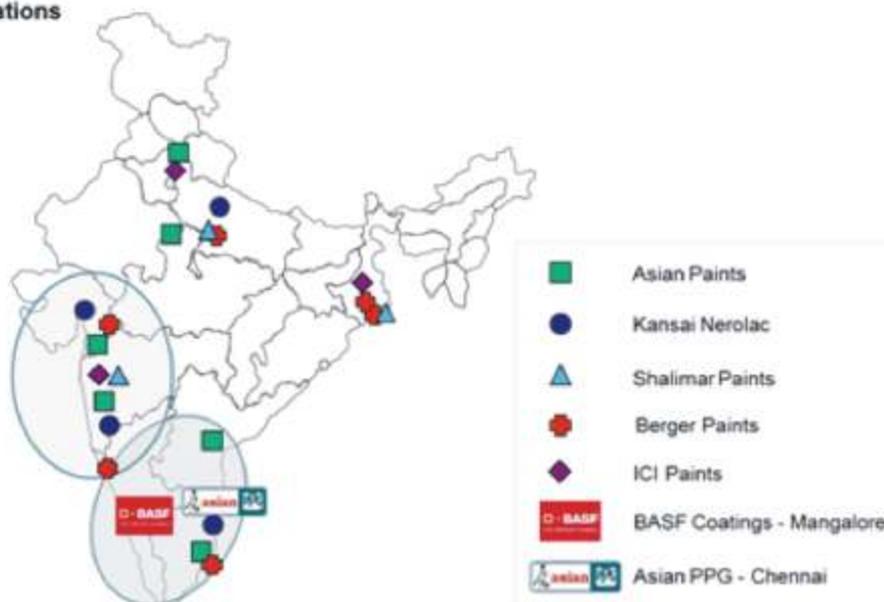
Source: Industry Reports, Secondary research

Market overview

The Indian paint industry is estimated at ~\$ 5 Bn in FY11. Paint industry is highly consolidated with 80% market captured by the organized sector. The major players in the paint industry are Asian Paints, Kansai Nerolac, Berger Paints and ICI. Key manufacturing locations of these players is given below (Refer Figure V10).

Figure V 10: Key manufacturing locations for paints

Manufacturing Locations



In the decorative segment, Asian Paints is the market leader followed by Berger and Kansai Nerolac. Kansai Nerolac is the leader in industrial paints followed by Berger and Asian PPG.

The Indian paint industry, valued at ~\$ 5 Bn in FY11, has been growing at 1.5-2 times the GDP growth with a CAGR of 13.5% over the last five years. Owing to the economic downturn, the growth slowed down in the last 2 years. However, the growth is reported to have picked up with the resurgence of the construction industry.

The Indian construction chemical industry is estimated at ~\$ 0.6 Bn in FY11. It has shown a strong growth rate of ~16% p.a., historically due to the construction boom in India and growing awareness in the industry for better quality of construction. With the economic slowdown, the growth slowed down in 2009, but has regained momentum thereafter.

The construction chemical market is highly competitive and with an increasing number of global construction companies making a foray into manufacturing operations in India, the

industry is becoming more attractive and experiencing strong growth. The overall market is fairly consolidated but there is considerable fragmentation of individual products and application areas. The top 5 players account for ~50% of the market; the rest comprises of small and unorganized players. FOSROC and SIKA India Pvt. Ltd. are the largest players in the Indian construction chemicals industry. Other key players include BASF, Pidilite and Structural Waterproofing Company (SWC) Pvt Ltd. There are many other regional and smaller players as well. 300 companies are estimated to be operating in this segment.

Industry trends

There is a shift in market shares in favour of organized companies at the expense of unorganized segment due to entry of organized players into low cost distempers and enamels. While solvent-based enamels are still popular in India, a shift is being seen from solvent- to water-based paints. Keeping the environment concerns in mind, companies are coming up with new lead free and low Volatile Organic Compound (VOC) products. There is also a perceptible shift towards usage of organic pigments in premium paints with heavy metal pigments being phased out. Companies which adapt to these trends could grow successfully in the paints market.

The construction chemicals market in India is still very under-developed when compared to other countries, such as China, which is much larger at nearly ~\$ 7.9 billion. Consumer awareness is very low regarding new chemical techniques and construction aids. Margins are lower because most contractors prefer low-cost chemicals to reduce the overall construction cost. High value products have limited demand and are used only by premium construction houses. In the past there has been a considerable change in the market share of companies. Medium-sized and regional manufacturers have gained considerable share of market.

Future growth potential

Paint Industry: With the market recovering from the economic downturn, the paint industry is expected to grow at a CAGR of 14% in the next five years. In the decorative paints segment, water based paints are expected to drive growth with a CAGR of 15%. The key growth drivers of the paint industry are detailed below:

- Low per capita consumption: The per capita consumption of paints in India is very low at 1.25 Kg against 38 Kg in Singapore, 25.8 Kg in the U.S or 2.5 Kg in China.
- Growth in automotive industry: Growth of automotive paint industry is directly linked to the growth of passenger vehicles and commercial vehicles (expected CAGR >15%).
- Rapid growth in residential and commercial real estate with regulation permitting 100% FDI flow

- Untapped rural market: There is a shift in rural demand from cement paints to better quality paints.
- Growing middle class with increasing disposable incomes

Construction Chemicals: The Indian construction chemicals market is expected to show high growth rate of 15-20% p.a., in the future. Key growth drivers for the construction chemicals market in India are as follows:

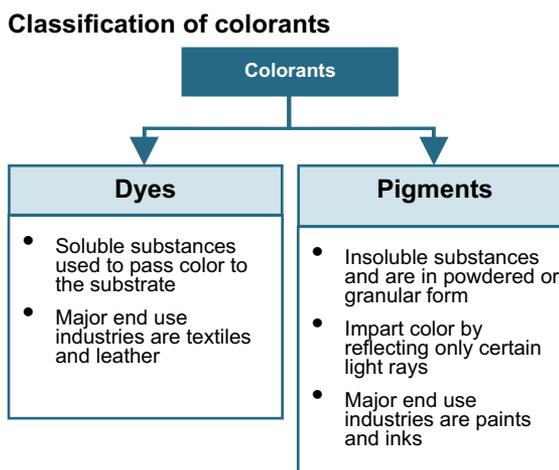
- Growth in end-use market: Growth in construction activities due to increased investments in infrastructure, backed by Government of India's commitment to increase spend in infrastructure to 10% of GDP in the 12th Five-Year Plan
- Increased penetration: Increasing awareness about quality construction materials such as performance-enhancing products among consumers and builders, leading to increased usage of newer products like ready-mix concrete (RMC) etc. Currently, the use of RMC in construction is around 7% of domestic cement demand. This is expected to rise to 20 to 25% over the next few years
- Changing regulatory environment: Current and prospective regulatory guidelines incentivizing energy-efficient and green buildings will drive demand for suitable, innovative protective coatings and safe chemicals
- Increasing compliance with international manufacturing standards: Actions are being taken to implement relevant consumer standards matching with international standards. For example, ban on onsite mixing of concrete would reduce pollution levels and generate demand for ready-mix concrete admixtures.

Many newly developed products give better performance and results. Hence, a shift in demand towards products offering better performance, value-added products such as silicon caulks, specialty cement additives, polymer-based grouts and mortars etc. is expected.

4. Colorants

Introduction

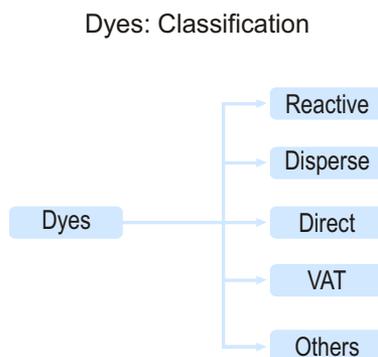
Figure V 11: Classification of colorants



(Refer Figure V 11).

Colorants have inherent element of value addition to a wide variety of products like textiles, leather, paper, food products, cosmetics, plastics, paints, inks and high-tech applications like optical data storage (CDs, DVDs), solar cells, medical diagnostics (CT Scan, angiography), security inks, lasers, photo dynamics etc. The colorant industry comprises two sub segments- dyes and pigments

Figure V 12: Classification of dyes

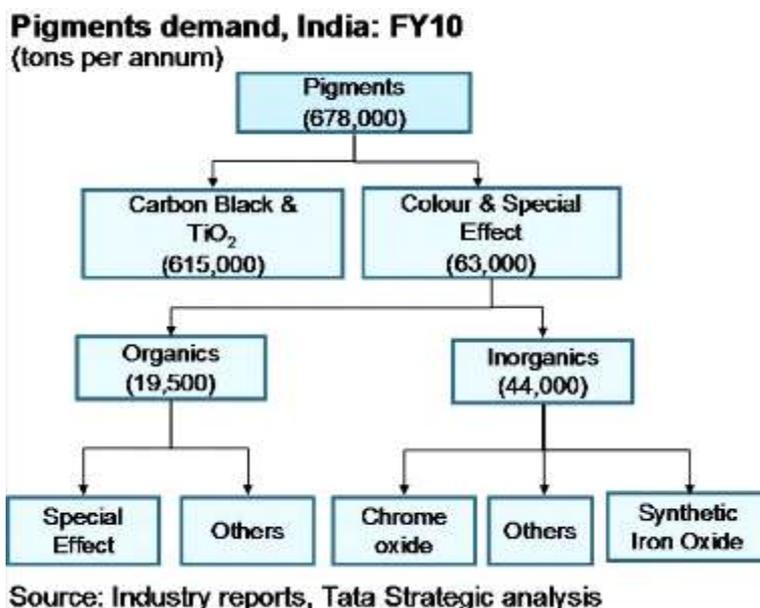


Source: Industry reports

There are 12 types of dyes, classified on the basis of the usage, however disperse, reactive and direct dyes are the most commonly used in India. (Refer Figure V12).

Pigments are broadly classified as organic and inorganic. The pigment market is estimated at ~7 lakh tons p.a. with a market size of ~USD 970 Mn. Carbon black and TiO₂ accounts for the 90% of the total pigment demand (Refer Figure V13).

Figure V 13: Pigments demand, India



There has been a notable transition in the global arena during the last 2-3 decades in the manufacturing base of colorants, with a shift in production from Europe, USA and Japan to Asia viz. China, India, Taiwan, Thailand and Indonesia etc. With decline in production in most of the traditional centers, non-traditional centers like India and China are now preferred sources for supply of colorants to the global market. India had a distinctive edge over other centers however based on supportive Chinese government policies the threat from Chinese manufacturers is increasing.

Preference for eco-friendly products has additionally cast responsibility on the industry to be more selective and improve the product range with greater focus on R&D. This would ensure quality and performance colorants to suit the market expectations.

Market overview

The world market for colorants comprising dyes, pigments and intermediates is presently estimated at approximate value of \$27 billion. During the last decade, the industry was growing at an average growth of 2-3% per annum. Whereas other countries in the world market contribute nearly 87.5% of the global share, India accounts for 12.5%. Size of the Indian colorants industry is \$3.4 billion in FY10 with exports accounting for ~68%.

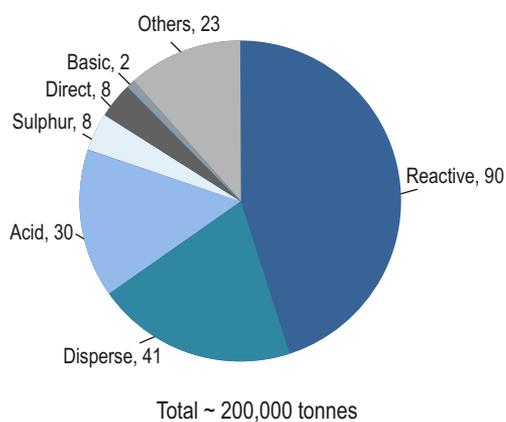
The Indian dyestuff industry is highly fragmented and characterised by a large number of players in the unorganized sector. Today, Indian dyestuffs industry comprises about 950 units (50 in large and organized sector and 900 units under Small & Medium Enterprises (SME) Sector). These units are mainly present in the western states of Gujarat and Maharashtra, with Gujarat accounting for almost 80% of capacity.

Within India, the major players in the pigments industry are Sudarshan Chemicals, Golchha Pigments, Tata Pigments and Clariant India while in the dyestuff industry, companies such as are Atul, Clariant India, Kiri dyes, and IDI are large players present in the organized sector.

The overall production capacity of dyestuffs is 200,000 tonnes per annum (Refer Figure V 14). With the ever increasing standards of quality and reliability, Indian dyestuffs industry meets more than 95% of the domestic requirement, out of which textile industry consumes nearly 60% and the remaining is shared by paper, leather & other consumer industries. As far as pigments are concerned, the market size is 115,000 tonnes (Refer Figure V 15). The main consumer industries are printing inks, paints, plastics, rubber, etc., accounting for 70% of the end use.

Figure V 14: Production of major dyes, India

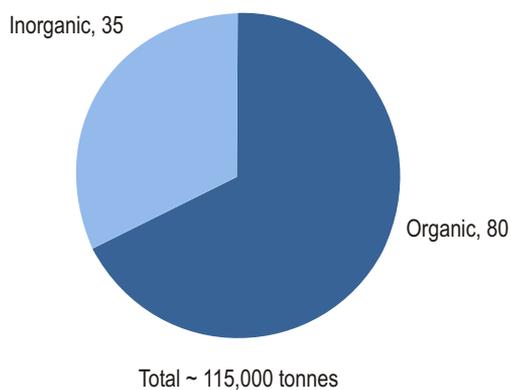
Production of major dyes, India ('000 tonnes)



Source: DMAI

Figure V 15: Pigment production, India

Pigment production, India ('000 tonnes)

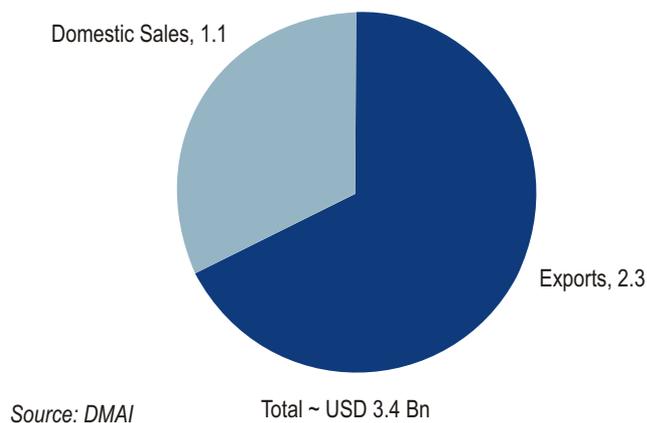


Source: DMAI

Total installed capacity for organic pigment is 80,000 tons p.a., which is way higher than the demand from the Indian market (Refer Figure V 13). Large proportion of the organic pigments produced is exported. There are also niche markets in India for special effect pigments such as metallic and pearlescent. These pigments are usually imported into the Indian market, with Sudarshan Chemicals being the only domestic manufacturer. Though the volume for these pigments would be very small as compared to other pigment segments, they usually command a premium for the design appeal that they provide to the final product such as automotive coatings and packaging materials.

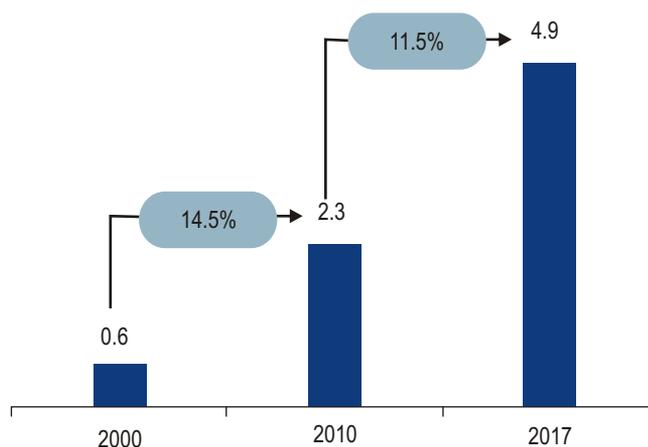
The industry has grown at ~10% p.a. between FY06 and FY10 with exports growth at 14.5% p.a. The dyestuffs are exported to Europe, South East Asia and Taiwan to cater to the textile industries in these countries.

Figure V 16: India colorants market breakup



There has been remarkable growth in the exports of colorants during the last 2 decades. From a mere \$0.03 billion in 1990, exports reached \$2.3 billion in 2009-2010 (Refer Figure V 16), having surpassed the estimates envisaged in the ten year strategic action plans submitted in 1991 and 2001. During the last decade, the industry achieved a growth of 14.5% p.a. Exports are estimated to grow to \$4.9 billion by 2017 (Refer Figure V 17).

Figure V 17: India colorants export (\$ bn)

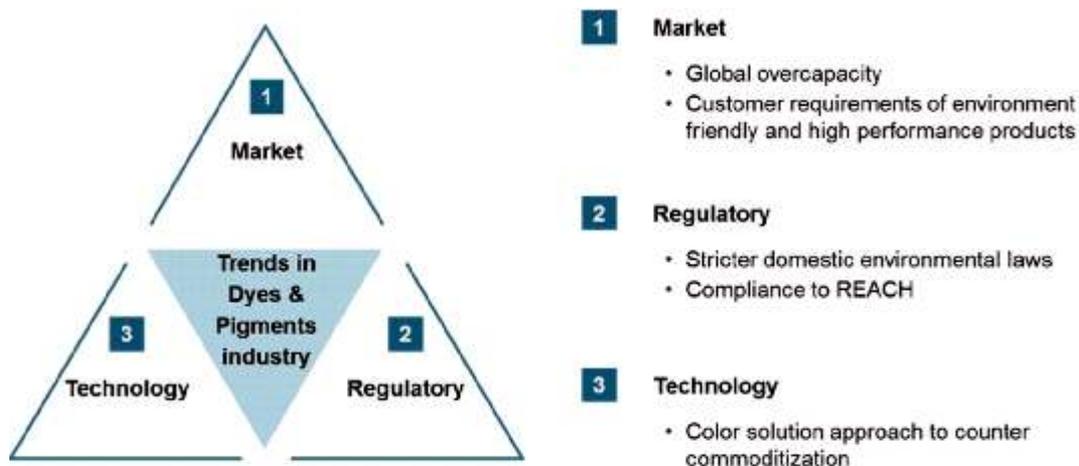


Source: DMAI

Market Trends - High performance products

The global capacity of dyestuffs has exceeded the demand resulting in an oversupply scenario. Due to the lack of export demand, the prices of the colorants had dropped by roughly 20% in the recent past. It is expected that consumer preference for environmentally friendly products and high performance dyes and organic pigments will help improve overall value of the market. (Refer Figure V 18)

Figure V 18: Industry trends for colorants



Source: Industry reports, Research by Tata Strategic

Regulatory Trends - Stricter environmental laws

Fiscal policies and excise concessions led to a high level of fragmentation in the Indian dyestuffs market. However, a gradual reduction in the excise duty has resulted in a more balanced pricing differential between the organized and unorganized sectors. The organised sector, with a better product range, technology and marketing reach, was able to increase its market share. Further, various regulations such as REACH and ban on certain dye stuffs have impacted the exporters resulting in the closure of small establishments and helping increase the share of the organized players.

Technological Trends - Commoditization

Since majority of dyestuffs are commodities there is not much product differentiation and duplication of products is easy. To counter the same, global manufacturers are investing in research and development to improve the specialty end of their portfolio.

There is also a trend towards providing colour solutions rather than just a colorant. Collaborations with equipment manufacturers are being undertaken to provide integrated solutions to customers.

The financial crisis in 2008 has resulted in a demand slump, worldwide over-capacity and further margin pressures on the dyestuff industry. The Indian dyestuff industry is facing challenges due to reduced export demand growth and decreasing profitability. Companies with greater focus on innovation and Research & Development will benefit in the long run. Adopting green chemistry practices and compliance could become the need of the hour.

Future growth potential

Globally, the demand for dyes and organic pigments is forecast to increase 9% per year to ~USD 16.2 Bn in 2013. This growth will have a direct bearing on the domestic production of dyes and organic pigments since a large proportion of production is exported. Moreover, after the REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) regulation, costs of handling effluents have increased. As a result a large number of companies have begun to relocate their operations to the Asian markets, particularly India and China.

Due to a greater use of polyester and cotton-based fabrics, there has been a shift towards reactive dyes used in cotton-based fabrics and disperse dyes used in polyester. The demand for reactive and disperse dyes is expected to grow fastest due to this continued demand.

The textile industry will remain the largest consumer of dyestuffs; however growth will be driven by markets such as printing inks, paints and plastics. These segments are also expected to increase the consumption of high performance pigments helping improve profitability. At around 8% growth, the Indian colorants industry (including pigments, dyes

and dye intermediates) is likely to reach ~USD 5.1 Bn by 2012-13 and is expected to capture 10-12% of the global market.

The basic raw materials used for the manufacture of dyestuffs are benzene, toluene, xylene and naphthalene (BTXN). The technology employed by the dyes sector has been well received in the international market. Some of the units have established joint ventures abroad using their indigenous technology. The per capita consumption of dyes in India is 50 gms as compared to 400 gms in Europe, 300 gms in Japan which shows that there is tremendous potential for the Indian market to absorb additional production.

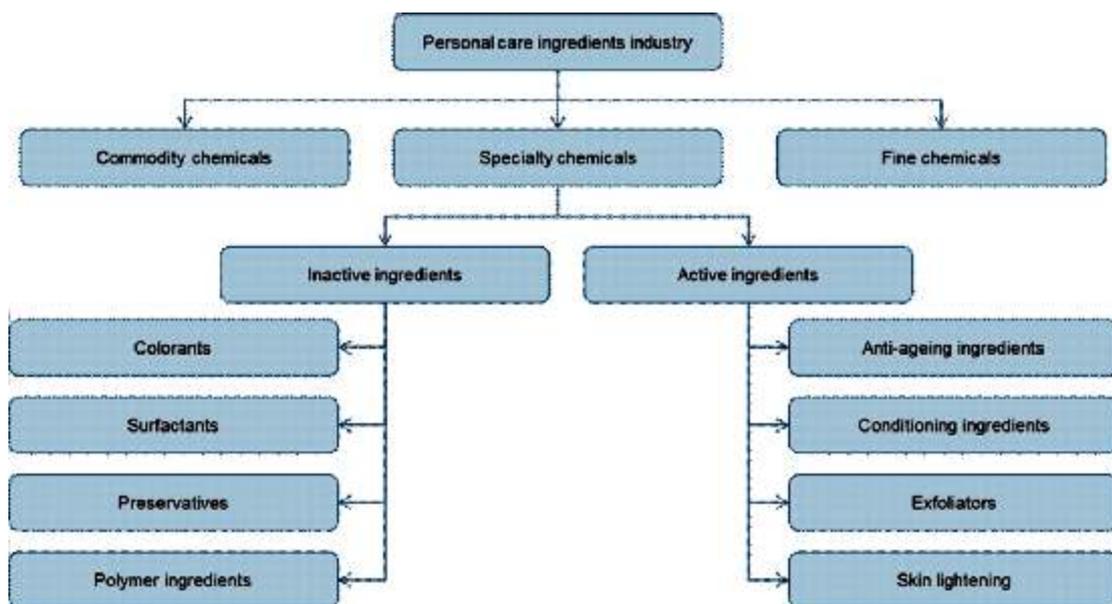
Considerable efforts have been put in by industry and academia on a continuous basis to deliver colorants with green environment. The need for high performance products has been to a great extent crystallized. There is also a noticeable trend in the world market with regard to color solution approach to counter commoditization with the advent of technological innovations. Innovations on plant based colorants are at advanced stages too and could become a strong game changer.

5. Personal care chemicals

Introduction

The market for personal care ingredients is broadly classified into commodity, fine chemical, and specialty chemical ingredients. Specialty ingredients are further classified as active and inactive ingredients based on their functionality in consumer products (Refer Figure V 19)

Figure V 19: Segmentation- Personal care ingredients industry



Inactive ingredients

Personal Care inactive ingredients refer to those ingredients that provide physical and process able properties to a formulation as opposed to active properties. These include ingredients such as surfactants, preservatives, colorants and polymer ingredients

Active ingredients

Personal Care active ingredients refer to those ingredients that add active property to a product that result in benefits to the end user as opposed to the formulation. These include ingredients such as Anti-ageing ingredients, exfoliators, conditioning agents and UV agents.

Market overview

Personal care ingredients market is valued at ~\$450 million in FY11 with Active ingredients accounting for ~40% of the total market. In 2011, the total Indian personal care inactive ingredient market was valued at ~\$270 million while active ingredients market was valued at ~\$180 million.

The market for personal care ingredients in India is becoming increasingly sophisticated. The constant entry of foreign manufacturers has raised the standards expected of suppliers in this market. Market is characterized by strong presence of MNCs like Cognis, Dow Corning, BASF, ISP, DSM, Merck etc. Domestic players like Vivimed Laboratories, SAMI Labs and India Glycols are gaining prominence.

Premium Segments in India are showing good growth potential with increasing awareness and evolving consumers who are ready to spend more on quality products.

Inactive personal care ingredients market has grown at a CAGR of 6.9% to reach ~\$270 million in FY11 from ~\$180 million in 2005 (Refer Figure V 20). Polymer ingredients and surfactants are key cost drivers for cosmetics and hence a major focus of cosmetics manufacturers' cost reduction. Most of the inactive ingredients are procured from domestic suppliers with imports for only special ingredients. The market share of inactive ingredients by application is also given below (Refer Figure V 21).

Figure V 20: Personal care Inactive ingredients Market

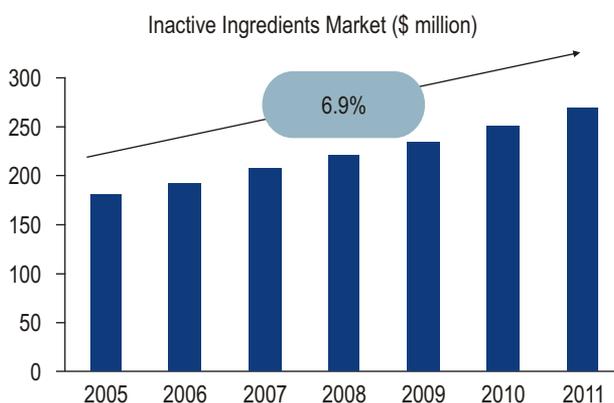
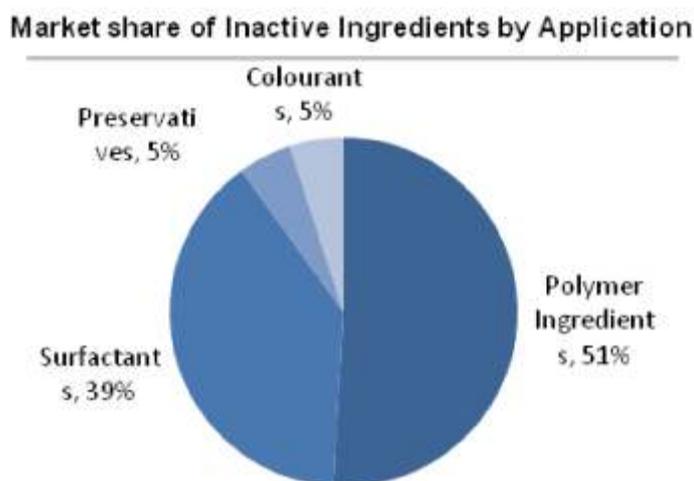




Figure V 21: Market share of Inactive ingredients by application



Active personal care ingredients market has grown from \$110 million in 2005 to reach ~\$180 million in 2011 (Refer Figure V 22), registering a CAGR of ~8.2%. In India, UV ingredients and conditioning agents have a mature market while Anti-aging agents and exfoliators are in growth phase. Active ingredients are the ones providing the final property to the product. There are not many manufacturers for the same in India and most of the active ingredients are being imported. The market share of active ingredients by application is also given below (Refer Figure V 23).

Figure V 22: Personal care Active ingredients market

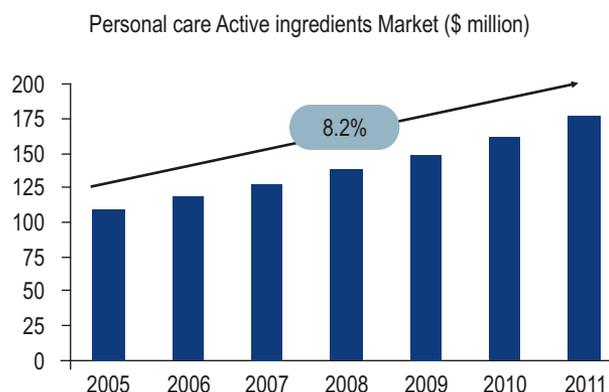
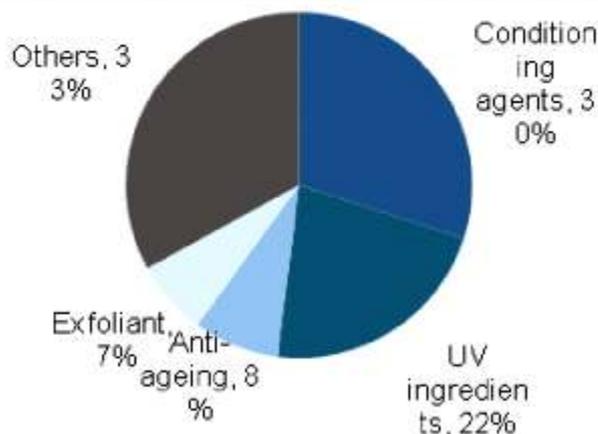


Figure V 23: Market share of Active ingredients by application

Market share of Active Ingredients by Application



Industry trends (Refer Table V 2)

Market trends

High price sensitivity has limited use of high value personal care ingredients. Market is also seeing advent of large corporations willing to take long term investment decisions in India. Typically different sets of personal care products and hence the ingredients are used for low and middle class segments as compared to the premium segments. There are many Indian players coming up to provide local substitutes for active ingredients.

Regulatory trends

There are multiple and complex regulations under different bodies due to which there is a lack in implementation of set guidelines and laws. Drugs and Cosmetics Act (1940) has laid down the general guidelines about imports, manufacturing, sales and distribution of personal care products in India. Bureau of Indian Standards has also framed standards about personal care products as well as the ingredients, completely based on the European Union's guidelines but these are also not enforced as regulations.

There is an also non-uniform licensing approval across states. Each state has its own FDA and license is granted by state where the manufacturing unit is located. No separate sales license is required and there are considerable variations in norms followed by each state. This leads to inconsistent approach across authorities in interpretation of a particular issue.

Technology trends

The market is seeing increasing demand for natural ingredients as customers are becoming more aware about the contents of the products they use. With certain products being considered carcinogenic and already been banned in foreign countries, there is a shift in Indian markets also though a complete ban has not yet been imposed by the government. For example: The surfactant industry is facing increased pressure to go green due to rising environmental concerns and the allergenic effects of synthetic surfactants, whereas International and national manufacturers are reducing their dependence on synthetic preservatives such as parabens, due to its carcinogenic activity.

Table V 2: List of applications, trends & implications for personal care ingredients

	Application	Key Trends	Implications
Inactive Ingredients	Surfactants	<ul style="list-style-type: none"> Increasing pressure to "go green" Focus on natural surfactants due to allergenic effects of synthetic ones 	<ul style="list-style-type: none"> Demand for vegetable-derived surfactants increasing Natural surfactants such as soap nut shells are becoming popular
	Colorants	<ul style="list-style-type: none"> Special effect pigments – colour shifting effects, heat-reflection etc. Customer demand for newer shades 	<ul style="list-style-type: none"> Need for joint product development with formulators Intense colours and new metallic shades being developed
	Preservatives	<ul style="list-style-type: none"> Reduction of dependence on synthetic preservatives Concerns about carcinogenic properties 	<ul style="list-style-type: none"> Small, local players gaining prominence Movement towards bio-based products
Active Ingredients	Polymer ingredients	<ul style="list-style-type: none"> Need for multi-functional polymers 	<ul style="list-style-type: none"> Increased innovation focus
	Anti-aging	<ul style="list-style-type: none"> Preference for natural products increasing 	<ul style="list-style-type: none"> Opportunity to use local knowledge of herbs and Ayurveda to introduce new products
	Conditioning	<ul style="list-style-type: none"> Increasing demand for moisturization Increasing competition in other related fields like skin care etc. 	<ul style="list-style-type: none"> Increased use of hair care humectants Hair care emollient demand acts as a potential growth area

Future growth potential

With increasing competition from MNC's and the organized sector, the segment is expected to see strategic alliances and acquisitions in future. The market is also expected to witness increased product differentiation and value addition aided by increasing spend on R & D even by the domestic suppliers. New ingredient formulations are supporting the market penetration for higher value and premium ingredients.

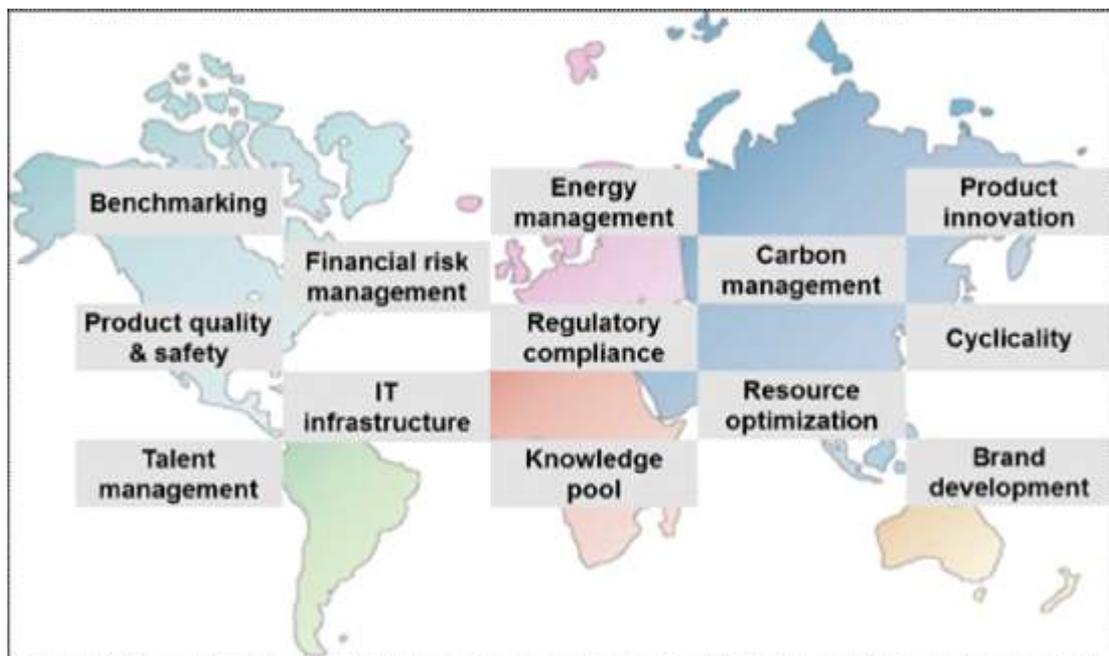
Increasing demand for personal care products with evolving customers is the key in driving the growth of personal care ingredients. Personal care products growth is being driven by factors such as increasing focus on rural markets, increasing disposable income, widening product portfolios and enhanced value realization by end consumers.

Personal care ingredients market is expected to register a growth of ~8% p.a. to reach a value of ~\$610 million by FY15. Active ingredients are expected to register a higher growth at ~9% p.a. as compared to the growth of inactive ingredients at ~7.4% p.a. This is mainly due to the improving penetration of functional products as compared to traditional products. Customers are demanding products for their exact skin type and needs and are willing to pay premium for quality product.



VI. Innovation and Sustainability

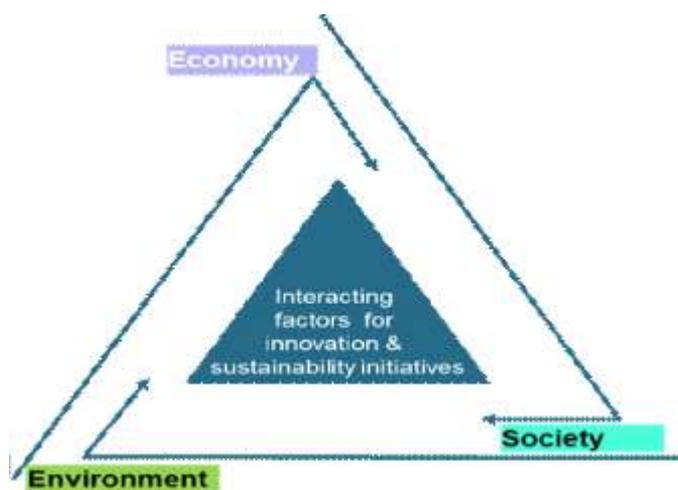
Figure VI 1: Sustainability map



The figure above (Refer Figure VI 1) represents some of the considerations of a specialty chemicals company for sustainability. A sustainable growth for specialty chemicals is most likely to depend on the scope of innovation. Various companies are now focusing on growth of demand and are leveraging innovation as the key to achieve it. Specialty chemicals can play a major role in improving the quality of life by enabling the manufacture of the goods and materials that we need whilst mitigating adverse environmental impact. By developing new usages of specialty chemicals, new processes and sustainable routes to produce, along with novel environmentally benign materials, we can achieve low carbon processes that make high value products that are safe for humans and solve energy and sustainability challenges.

The following chart (Refer Figure VI 2) depicts the three important interacting factors which define the need for innovation and sustainability initiatives.

Figure VI 2: Interacting factors pushing for innovation and sustainability initiatives



Currently India fares poorly in chemical research and innovation, accounting for only ~5% of the global chemical research papers and only ~1% of the global chemical patents. The overall investment in R&D research scenario in India is reverse to the scenarios in developed countries. Most of the developed nations have 60-70% of total R&D and innovation initiatives by industries whereas in India more than 50% research in chemicals is by Government. The average R&D intensity in India chemical sector was ~2.5% (in FY09). Bulk of this intensity is due to knowledge intensive specialty chemicals while the bulk chemicals and fertilizers are at the lower spectrum. In terms of global comparison average R&D of chemical sector is almost half to the developed countries.

1. Green chemistry

Green chemistry focuses on encouraging the development of products and processes that eliminate or reduce the use of hazardous substances. However with evolving understanding of the consumers about the downsides of existing processes Green chemistry is no longer a proactive step. It is increasingly becoming a tool for competitiveness. Consumers in many developed countries in Europe and USA are willing to pay a premium for green chemistry. The adoption of green production and green products is likely to determine the competitive positioning in near future.

2. Climate change

Climate change is one of the mega trends impacting the industries across the globe. The attitude of community and governments towards adverse impact to climate is becoming more stringent and hence new regulations are coming into effect. Reduction in CO₂

emission is becoming very important for industries to sustain.

Local companies along with MNCs are taking steps to control it. Some of the steps to making specialty chemicals production sustainable in this parameter are:-

- i) Carbon capture and storage e.g.: use of supercritical CO₂ for solvent, enhanced oil recovery, ecofriendly Water Dispersible granules (WDG), Suspension Concentrates (SC), Oil Dispersion (OD), Micro-emulsion (ME), and Emulsion oil in Water (EW) etc.
- ii) Use of aqueous hydrogen peroxide for clean oxidations, use of better catalyst for better conversion efficiencies etc.
- iii) Energy conservation: use of renewables for power generation
- iv) Introduce eco-friendly/bio degradable/bulk/recyclable packaging

However just a focus on environment and society is not going to complete the pillar and hence the economics aspect must also be covered for an innovation based sustainability strategy. Some of the economic implications of innovations are:-

- i) A low energy footprint results in saving power and energy, the cost of which is substantial for production of specialty chemicals.
- ii) Shift towards high value activities could result in higher premiums, brand development etc. and may compensate for the cost of innovation. This along with a focus on geographic expansion is likely to bring in more demand for high value products.
- iii) Reduction in the cyclicity of the portfolio along with the efficient utilization of raw materials could be another aspect where innovation may drastically impact the economic gains
- iv) Focus on building knowledge capital and talent pool is likely to bring in innovation that could drive the competitive positioning of specialty chemical firms
- v) With more tighter environmental norms expected to come, it becomes imperative to develop the specialty chemical products in line with the future needs

Some of these sustainability and innovation initiatives are also needed to be taken up by the industry together. Setting up of standards or benchmarking, awareness of customers and producers, recognitions and awards etc. are important for innovation to become a part and parcel of specialty chemical production.

Compliance with REACH and other stringent regulations imposed by EU and US markets should encourage the Indian specialty chemical manufacturers to increase their focus on innovation and sustainability. Indian government currently does not have any stringent regulations or environmental mandates forcing Indian manufacturers however with increasing globalization and awareness of consumers, investment in innovation could pay rich dividends later.

VII. Challenges & Issues: Possible strategies

Specialty chemicals companies have a good growth opportunity ahead but their success will hinge upon how well they address prevailing challenges. Some of the imminent needs / challenges for the specialty chemical industry are -

Feedstock availability & dependence upon imports for intermediates:

India is a naphtha surplus country and exports most of its naphtha because of lack of crackers. If this scenario continues to prevail then there will always be lack of basic building blocks for specialty chemical industry with dependence upon imports for intermediates becoming very high. Hence, domestic production will be restricted.

To address this, companies need to join hand and strongly push for healthy regulations and policies which encourage setting up crackers in India. Government is trying to set up consortium crackers and PCPIRs which is a positive step. However focus should be on maximizing production of value added products in the country and not on naphtha exports. Even though consortium PCPIR's are planned, long gestation period, inadequate infrastructure and policy hurdles have made their execution a challenging task. Government needs to work with industry and provide answers to these issues.

Besides the above, upstream chemical producers need to work in tandem with downstream speciality chemical companies to ensure adequate and consistent availability of feedstocks. A collaborative effort in terms of long terms off-agreement between upstream and downstream companies should be encouraged to create a win-win situation for both.

Highly fragmented industry:

Currently the specialty chemical industry is highly fragmented. Although, some companies have created world class size, majority operate with limited / small capacities. Hence, the sector as a whole has not been able to fully leverage economies of scale.

Going ahead, the players need to take a long term view and focus on developing large capacities rather than incremental capacity. Investment should be towards building scale, achieving economies of scale and ensuring that domestic demand is met over long term.

Besides the above, companies need to actively look at consolidation as that will help reduce fragmentation and enhance competitiveness. Companies should focus on their "core competence" and the businesses or segments which do not constitute "core" of business should be divested.

Limited focus in Technology up gradation and R&D:

Specialty chemicals industry is knowledge driven and progresses on innovation either by creating breakthrough molecules or meeting the unmet needs of various industries. Indian companies currently lack true R&D and spend less than a percent of their sales on such efforts. They are also not upgrading to new processes / technologies at a brisk pace. Even though we have a large pool of scientists and chemists, the speciality chemicals industry falls way behind in development of new molecules/ products and filing of patents when compared to USA, China etc. Many times, investment towards R&D takes a backseat with respect to continuing day to day operations for Indian companies. Significant numbers of companies continue to practice technologies which have either become cost in-efficient or outdated.

This needs to be addressed if companies need to establish themselves as leading players in their respective segments. A strong commitment from management / promoters is needed in order to achieve this. Companies can leverage strong talent pool, take Government support, and centres such as IIP and NCL in order to strengthen their R&D activities.

Moreover, the companies should build strong linkages to academia. This will give companies access to domain experts and talent pool. In turn, academia can benefit by getting access to vocational training for their students as well as funding for academia projects.

Indian government has planned to set up a TUF (Technology Up gradation Fund) which could be tapped by the Indian companies. Apart from TUF, the companies should focus towards increasing collaboration & sharing of best practices. Companies should also explore the option of Mergers, acquisitions & alliances to enhance their technology.

Going forward, focus on R&D and technology up gradation will be a key differentiator for companies and will be vital to their business success.

Common man perception:

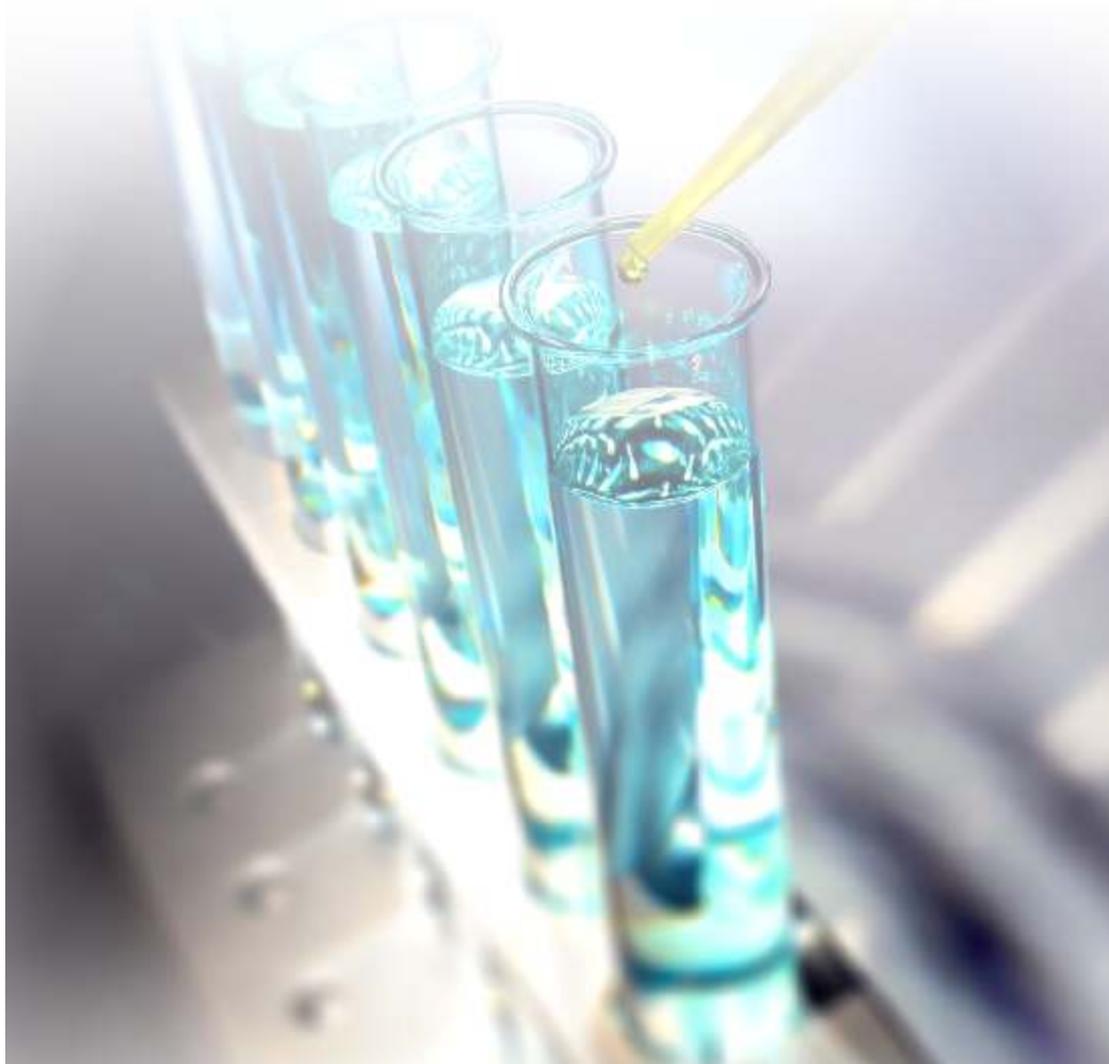
Even though speciality chemicals touch our lives every day be it in the form of toothpaste or the cell phones we use or cars we drive, yet, the perception of people is that chemicals are not good and harm human beings. This perception has been created because of safety lapse incidents and waste management practices prevailing in our country. Such perception also creates inhibitions in the mind of young generation and restricts them to get interested in chemistry or chemical industry related career.

Specialty chemical companies need to highlight the advantage that chemistry brings to the world. Without chemistry, there would be no water or oxygen, the essence of life.

Companies need to make their surrounding "green" and should conduct campaigns to educate the young generation. Such information campaigns will not only educate people about the "good aspects" of chemicals it will also be a good brand development opportunity for companies.

While speciality chemical industry addresses growing need for materials required by different sectors, the companies require complex manufacturing processes that often involve handling of toxic and hazardous chemicals. As a result, importance of safety, health and environmental (SHE) protection cannot be underestimated.

Companies need to ensure that meet all safety norms and follow norms as laid out by the government from time to time. Compromising on SHE norms might appeal economically in the short term but the long term repercussions are severe and lead to several irreversible damages to environment and health of human beings working in such environment.



VIII. References

1. Handbook on Indian Chemical Industry, IndiaChem2010, prepared by Tata Strategic & Roland Berger
2. Knowledge Paper on Specialty, Fine Chemicals, Agrochemicals, Dyes & Pigments and SME Sector in Gujarat State, IndiaChem Gujarat 2011
3. Specialty Chemical Seminar organized by CII, 2011
4. Specialty Chemicals report by Indian Specialty Chemical Manufacturers' Association
5. Indian Specialty Chemicals Market 2009, Frost & Sullivan
6. Crisil Research
7. www.projectinfo.in

IX. About Tata Strategic

About Tata Strategic:

Tata Strategic Management Group is the largest Indian Owned Management Consulting Firm. Set up in 1991, Tata Strategic has completed over 500 engagements with more than 100 Clients across countries and industry sectors, addressing the business concerns of the top management. Today more than half the revenue of Tata Strategic Management Group comes from working with companies outside the Tata Group. We enhance client value by providing creative strategy advice, developing innovative solutions and partnering effective implementation.

Our Offerings





Contacts at Tata Strategic

<p>MANISH PANCHAL </p> <p>PRACTICE HEAD – CHEMICAL & ENERGY</p> <p>Phone: +91 22 6637 6713 Mobile: +91 98205 20303 e-mail: manish.panchal@tsmg.com</p>	<p>CHARU KAPOOR </p> <p>ENGAGEMENT MANAGER – CHEMICALS</p> <p>Phone: +91-22-66376756 Mobile: +91 98218 06071 e-mail: charu.kapoor@tsmg.com</p>
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TATA STRATEGIC MANAGEMENT GROUP

<p>Mumbai B-1001, Marathon Futurex N. M. Joshi Marg, Lower Parel East Mumbai 400013 INDIA</p> <p>Phone: +91 22 6637 6789 Fax: +91 22 6637 6600</p>	<p>Delhi Jeevan Bharati Tower, 10th Floor 124 Connaught Circus New Delhi 110001 INDIA</p> <p>Phone: +91 11 2332 7072 Ext 118/131 Fax: +91 11 2332 6265/6655</p>
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Reports co-authored by Manish Panchal, Charu Kapoor and Avinash Singh?

X. About FICCI



Industry's Voice for Policy Change

About FICCI

Established in 1927, FICCI is the largest and oldest apex business organisation in India. Its history is closely interwoven with India's struggle for independence, its industrialization, and its emergence as one of the most rapidly growing global economies. FICCI has contributed to this historical process by encouraging debate, articulating the private sector's views and influencing policy.

A non-government, not-for-profit organisation, FICCI is the voice of India's business and industry.

FICCI draws its membership from the corporate sector, both private and public, including SMEs and MNCs; FICCI enjoys an indirect membership of over 2,50,000 companies from various regional chambers of commerce.

FICCI provides a platform for sector specific consensus building and networking and as the first port of call for Indian industry and the international business community.

Our Vision

To be the thought leader for industry, its voice for policy change and its guardian for effective implementation.

Our Mission

To carry forward our initiatives in support of rapid, inclusive and sustainable growth that encompass health, education, livelihood, governance and skill development.

To enhance efficiency and global competitiveness of Indian industry and to expand business opportunities both in domestic and foreign markets through a range of specialised services and global linkages.

XI. Profile of key specialty chemical manufacturers

a. Agrochemicals

Brief profile: Bayer CropScience

Bayer CropScience India		
Company overview	<ul style="list-style-type: none"> Bayer CropScience is one of the world's leading cropscience companies in the world with presence in 122 countries 	
Product segments/ Verticals	<ul style="list-style-type: none"> Crop Protection Environmental Science Bioscience 	
Manufacturing locations	<ul style="list-style-type: none"> Three manufacturing locations at Thane, Himmatnagar & Ankleshwar Total production capacity of 5770 MT of active ingredients and formulation capacity of 10,025 KL & 3650 Mt for liquids & solids respectively 	
Key Mergers/ Acquisitions	<ul style="list-style-type: none"> Merger with Aventis Cropscience Limited worldwide, 2002 Acquisition of Biotech company Athenix Corp., 2009 	

Brief profile: Rallis

Rallis India		
Company overview	<ul style="list-style-type: none"> Rallis is one of the leading Indian agrochemical company 	
Product segments/ Verticals	<ul style="list-style-type: none"> Agri business domestic: Five segments: Pesticides, seeds, fertilizers, household products & seed treatment chemicals Institutional business: Formulations & technical bulk sales to leading companies like Bayer, Syngenta, UPL, etc Contract services: Partnering with leading companies for contract manufacture of technical grades/ formulations & intermediates 	
Manufacturing locations	<ul style="list-style-type: none"> Five manufacturing plants at Turbhe, Akola, Ankleshwar, Lote & Patancheru Total installed capacity of pesticides is 16,720 MT for solids & 12,500 MT for liquids 	
Key Mergers/ Acquisitions	<ul style="list-style-type: none"> Majority stake in Bangalore based Metahelix Life, 2010 Co-marketing alliances with several companies such as DuPont, Syngenta, Bayer, FMC, Makhteshim Chemical works, Ghrada Chemicals, etc 	

Brief profile: United phosphorus

United Phosphorous Limited		 UNITED PHOSPHOROUS LIMITED
Company overview	<ul style="list-style-type: none"> Established in 1969 and has its presence in all value-added agricultural inputs ranging from seeds to crop protection & post harvest activity Has its own subsidiary offices worldwide Global player with customer base in 86 countries 	
Product segments/ Verticals	<ul style="list-style-type: none"> Agrochemicals Specialty chemicals Industrial chemicals 	
Manufacturing locations	<ul style="list-style-type: none"> 21 manufacturing location across the globe with 9 in India Production capacity of 98,264 MT of pesticides & 42,631 MT of pesticides intermediates 	
Key Mergers/ Acquisitions	<ul style="list-style-type: none"> Product acquisitions from DuPont and Bayer Company acquisitions of Metahelix Life, Evofarms, AG, Cequisa and ICONA 	

Brief profile: Syngenta

Syngenta India Limited		
Company overview	<ul style="list-style-type: none"> 84% subsidiary of Syngenta Global Formed by merging agri-businesses of Novartis & Astra 	
Product segments/ Verticals	<ul style="list-style-type: none"> Seeds Crop protection chemicals 	
Manufacturing locations	<ul style="list-style-type: none"> Manufacturing plant at Santa Monica, Goa 	
Key Mergers/ Acquisitions	<ul style="list-style-type: none"> Co-marketing alliance with Rallis India Crop protection technology exchange with DuPont, partnership on improving crop quality with Embrapa - the Brazilian Agricultural Research Corporation, R&D agreement with Dow AgroScience Product license from Sumitomo 	

Brief profile: Gharda Chemicals

Gharda Chemicals Limited		
Company overview	<ul style="list-style-type: none"> Established in 1967 A major player in domestic and export market in India 	
Product segments/ Verticals	<ul style="list-style-type: none"> Agrochemicals Intermediates Pigments High performance polymers Contract services 	
Manufacturing locations	<ul style="list-style-type: none"> Dombivli, Ankleshwar, Lote, Jammu & Panoli 	
Key Mergers/ Acquisitions	<ul style="list-style-type: none"> Set up Gujarat Insecticides Ltd. In joint venture with Gujarat Agro Industries Corporation Ltd. In 1980 In 1996, Gharda Chemicals purchased the entire holdings of Gujarat Agro Industries Corporation Ltd and Gujarat Insecticides Ltd. Became the subsidiary of Gharda Chemicals. 	

b. Fine chemicals

Brief profile: Piramal Healthcare

Piramal Healthcare Limited www.piramalhealthcare.com		
Company overview	<ul style="list-style-type: none"> It has a global footprint of over 100 countries Aspires to be the first Indian company to discover, develop and launch its own NCE drug in the global market It has more than 115 issued patents and 395 pending patent applications in several countries 	
Key brands	<ul style="list-style-type: none"> Saridon, Lacto Calamine, i-pill, Supractiv, Triactiv, Polycrol, Workz 	
Manufacturing locations	<ul style="list-style-type: none"> Mumbai, Medak (AP), Chennai, Pithampur (MP), Ahmedabad Raigad (MH), Thane (MH), Baddi (HP) 	

Brief profile: Divis Laboratories

Divis Laboratories Limited www.divislabs.com		
Company overview	<ul style="list-style-type: none"> Established in 1990 with first plant in 1995 Focus on research & development 	
Key segments	<ul style="list-style-type: none"> Generics, Intermediates, Protected amino acids, Chiral synthesis, Carotenoids and Nutraceuticals 	
Manufacturing locations	<ul style="list-style-type: none"> Vishakapatnam and Nalgonda (Andhra Pradesh) 	

Brief profile: Cadila Pharmaceuticals

Cadila Pharmaceuticals Limited www.cadilapharma.com		
Company overview	<ul style="list-style-type: none">• It has a global footprint in over 90 countries• One of the largest privately held pharmaceutical companies in India• Offers more than 50 APIs and has filed 33USDMFs	
Key brands	<ul style="list-style-type: none">• Envas, Aciloc, Symbiotik, Clax, Rabeloc etc.	
Manufacturing locations	<ul style="list-style-type: none">• API:- Ankaleshwar, Gujarat	

Brief profile: Dishman

Dishman Group www.dishmangroup.com		
Company overview	<ul style="list-style-type: none">• Dishman provides a range of solutions at locations in Europe, China and India• Provide highly potent API services which are offered under the carbogen amcis business apart from contract research and manufacturing services (CRAMs)	
Key brands	<ul style="list-style-type: none">• Carbogen AMCIS business, specialty chemicals	
Manufacturing locations	<ul style="list-style-type: none">• Ahmedabad (Naroda and Bavla plant)	

c. Paints, Coatings & Construction chemicals

Brief profile: Asian Paints

Asian Paints www.asianpaints.com		
Company overview	<ul style="list-style-type: none">• India's largest paint company and Asia's third largest paint company	
Key products	<ul style="list-style-type: none">• Operates in 17 countries and has 24 paint manufacturing facilities in the world• Ancillaries, Automotive coatings, Industrial paints and Decorative Paints	
Manufacturing locations	<ul style="list-style-type: none">• Raigad, Satara (Maharashtra),• Ankleshwar (Gujarat), Rohtak (Haryana)• Kanchipuram, Cuddalore (Tamil Nadu), Medka (AP)	

Brief profile: Kansai Nerolac

Kansai Nerolac www.nerolac.com 	
Company overview	<ul style="list-style-type: none"> It is the second largest coating company in India and the market leader in automotive and powder coating Nerolac paints is an established brand in decorative paints
Key products	<ul style="list-style-type: none"> Automotive Coatings, Decorative Paints, Powder Coatings, High Performance Coatings, General Industrial Coatings
Manufacturing locations	<ul style="list-style-type: none"> Ratnagiri (Maharashtra), Kanpur (UP), Rewari (Haryana) Hosur (Tamil Nadu)

Brief profile: Rhodia

Rhodia Specialty Chemicals India Ltd. www.rhodia.com 	
Company overview	<ul style="list-style-type: none"> Formerly Albright & Wilson Chemicals India Ltd. (acquired in 2000 by Rhodia)
Key products	<ul style="list-style-type: none"> Alkamuls OR 36, Igepal BC/4, Rhodafac
Manufacturing locations	<ul style="list-style-type: none"> Roha, Maharashtra

Brief profile: BASF Coatings India Ltd.

BASF Coatings India www.basf-india.com 	
Company overview	<ul style="list-style-type: none"> Independent division of BASF India Prominent in automotive coatings
Key product lines	<ul style="list-style-type: none"> Electrodeposition coatings, primer surfacer, top coats, base coats, paint system for plastic components
Manufacturing locations	<ul style="list-style-type: none"> Dadra & Nagar Haveli

Brief profile: Fosroc India

Fosroc India www.fosroc.com		
Company overview	<ul style="list-style-type: none">• Wholly owned subsidiary of Fosroc International	
Key products	<ul style="list-style-type: none">• Admixtures, joint sealants, surface treatments	
Manufacturing locations	<ul style="list-style-type: none">• Bangalore• Ankleshwar• Rudrapur	

Brief profile: Sika India

Sika India www.sika.in		
Company overview	<ul style="list-style-type: none">• Convened India operations in 1987• Subsidiary of Switzerland-based parent company	
Key products	<ul style="list-style-type: none">• Waterproofing: Sikacim• Tiling: Sika Tilofix• Sealing: SikaBoom	
Manufacturing locations	<ul style="list-style-type: none">• Kalyani, West Bengal• Goa• Jaipur• Blending units in Mumbai and Chennai	

Brief profile: BASF Construction

BASF Construction Chemicals Division www.basf-cc.co.in		
Company overview	<ul style="list-style-type: none">• Wholly owned by the BASF group	
Key products	<ul style="list-style-type: none">• Concrete admixtures, joint sealants, flooring and waterproofing	
Manufacturing locations	<ul style="list-style-type: none">• Turbhe, Navi Mumbai	

Brief profile: Pidilite

Pidilite www.pidilite.com		
Company overview	<ul style="list-style-type: none"> Started operations in 1959, a pioneer in consumer and specialties chemicals in India 	
Key products	<ul style="list-style-type: none"> Adhesives and sealants 	
Manufacturing locations	<ul style="list-style-type: none"> Himachal Pradesh Maharashtra Gujarat 	

d. Colorants

Brief profile: Sudarshan India

Sudarshan India www.sudarshan.com		
Company overview	<ul style="list-style-type: none"> Largest pigment and sole effect pigment manufacturer Present in business for over 50 years 	
Key brands	<ul style="list-style-type: none"> Colours: Sudaperm, Sudafast, Sudacolor Effects: Sumica, Sumicos 	
Manufacturing locations	<ul style="list-style-type: none"> Roha and Mahad (Maharashtra) 	

Brief profile: Golchha Pigments

Golchha Pigments www.golchhapigments.com		
Company overview	<ul style="list-style-type: none"> One of the largest manufacturers of synthetic iron oxide pigments in India Also into manufacturing high quality oxide flooring colours, Wall Putty, Tile Adhesive, Cement Paints, Cement Primer and Waterproofing Compound 	
Key brands	<ul style="list-style-type: none"> Cement Paint: WONDERCEM & ECOCEM , WONDER WHITE, WONDERFIX Water Proofing: WONDERSEAL, WONDER WALL PUTTY 	
Manufacturing locations	<ul style="list-style-type: none"> Kalunga and Rourkela in Orissa and Bilaspur in Chattisgarh and a dedicated export office in Rourkela 	

Brief profile: Atul Industries

Atul Industries www.atul.co.in 	
Company overview	<ul style="list-style-type: none"> Diversified company with presence in colours, aromatics, agrochemicals, polymers and pharma intermediaries
Key brands	<ul style="list-style-type: none"> Vat dyes: Novatic Acid dyes: Tulacid Direct dyes: Tuladir
Manufacturing locations	<ul style="list-style-type: none"> Atul and Ankleshwar (Gujarat)

Brief profile: Clariant Chemicals India

Clariant Chemicals India www.clariant.in 	
Company overview	<ul style="list-style-type: none"> One of India's leading specialty chemicals companies No. 1 player in Pigments, Textile Chemicals, Leather Chemicals and Biocides for Paints
Key brands	<ul style="list-style-type: none"> Flame retardants: Exolit®, Polymer additives: Hostavin® Emulsions: Mowilith®, Mowicoll®, Appretan® Masterbatches : REMAFIN®, RENOL®
Manufacturing locations	<ul style="list-style-type: none"> Kolshet (Thane), Roha (Raigad), Cuddalore, Kanchipuram

e. Personal care ingredients

Brief profile: Vivimed Labs

Vivimed Labs www.vivimedlabs.com 	
Company overview	<ul style="list-style-type: none"> Sales footprint across 50 geographies with SBUs in USA, Europe and a marketing office in China
Key product lines	<ul style="list-style-type: none"> Oral care: Anti-bacterial, enamel protection Skin care: Anti-ageing, skin lightening Hair care: Jarocol, dyes, anti-dandruff, UV filters
Manufacturing locations	<ul style="list-style-type: none"> Bonthapally, Bidar, Jeedimetla (Andhra Pradesh) Haridwar, Kashipur (Uttarakhand)

Brief profile: Sami Labs

Sami Labs Ltd. www.samilabs.com		
Company overview	<ul style="list-style-type: none"> Established 1991 in Bangalore Sales footprint and strategic alliances in USA, Europe, Japan, Australia, Middle East, South Africa, China, 	
Key products	<ul style="list-style-type: none"> Alpha lipolic acid Cococin Ellagic acid 	
Manufacturing locations	<ul style="list-style-type: none"> Bangalore (4 plants) Hyderabad Utah, USA 	

Brief profile: India Glycols

India Glycols www.indiaglycols.com		
Company overview	<ul style="list-style-type: none"> Established in 1983, A leading company that manufactures green technology based bulk, specialty and performance chemicals and natural gums, spirits, industrial gases, sugar and nutraceuticals 	
Key products	<ul style="list-style-type: none"> PE Glycols, Fatty Acid/ alcohol Ethoxylates Phytochemicals, Polysorbates, Glycol ethers Performance Chemicals, Natural Gums 	

f. Others

Brief profile: S H Kelkar & Co.

S H Kelkar www.kelkargroup.com		
Company overview	<ul style="list-style-type: none"> Largest Indian flavours and fragrances manufacturer In business for over nine decades 	
Key end-use customer segments	<ul style="list-style-type: none"> Flavours: Dairy products, bakery, savouries, pharma Fragrances: Personal care, hair care, fabric care 	
Manufacturing locations	<ul style="list-style-type: none"> Patalganga, Maharashtra 	

Brief profile: Sachee Aromatics

Sachee Aromatics www.sachee.com		
Company overview	<ul style="list-style-type: none">Started by Mr. Manoj Arora, a leading aroma chemical manufacturer for five decades	
Key end-use customer segments	<ul style="list-style-type: none">Personal wash, personal care, fabric care, incense sticks, aerosols, candles, tobacco products	
Manufacturing locations	<ul style="list-style-type: none">DelhiParis	

Brief profile: Givaudan

Givaudan www.givaudan.com		
Company overview	<ul style="list-style-type: none">One of the leading, MNC, manufacturer of flavour and fragrance for consumer products	
Key end-use customer segments	<ul style="list-style-type: none">Beverages, Dairy, Health & wellness, Savoury, Personal care, Home care	
Manufacturing locations	<ul style="list-style-type: none">Daman (flavour production)Bangalore (fragrance production)Mumbai (fragrance and flavour creation/application)	

Brief profile: International Flavors & Fragrances

International Flavors & Fragrances www.iff.com		
Company overview	<ul style="list-style-type: none">A leading global creator of flavors and fragrances	
Key end-use customer segments	<ul style="list-style-type: none">Beverages, Dairy, Savoury, Beauty care, Fabric care, Home care	
Manufacturing locations	<ul style="list-style-type: none">Chittoor, Andhra Pradesh (flavour production)Chennai (Flavour, fragrance, ingredients production)	