Future of Chemical Industry in India - Way forward to achieve growth estimates

21st August 2019, Hotel Le - Meridien, New Delhi
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. With Asia’s growing contribution to the global chemical industry, India emerges as one of the focus destinations for chemical companies worldwide. With the current size of approximately US$163 billion in FY18, the Indian chemical industry accounts for a very small part of the global chemical industry today.

Chemicals and related products such as fertilizers, paints, petrochemicals, pharmaceuticals and others make up for a significant part of the Indian economy. Among the most diversified industrial sectors, chemicals cover an array of more than 70000 commercial products. The industry constitutes of both small and large scale units and as the ‘Make in India’ initiatives are gaining traction in the country, investments and infrastructure are going to be major thrust areas for chemical industry players.

While there are several challenges like stricter environmental regulations, increasing cost of raw materials, overall economic slowdown in recent times et al, the policies and incentives provided by the Government are driving growth. The industry has ambitious growth targets and it is estimated to grow at CAGR 9% to reach a volume of US$ 304 billion by FY25. The growth is likely to be driven by rising demand in end-use segments for speciality chemicals and petrochemicals.

The recent trade war between USA and China and Brexit are two global events that can have a significant positive impact on the Indian chemical sector growth.

The USA, EU and UK markets are ripe for disruption this year as China has been the single largest supplier to USA and post import duty tariff regime, Indian companies needs to look at US business with alacrity. With nearly $15 billion Chinese exports in chemicals and plastics subject to US tariffs, India is set to gain market share in US market. Further, Chinese buyers are also seeking product sourcing from India due to their own environment related problems and our chemicals and plastics export have seen a consistent growth.

Several US and European chemical manufacturers are looking at shifting their manufacturing base from China. India and Vietnam are two probable major destinations.

If all the relevant stakeholders including the Government, the Industry, the technology suppliers, the supply chain and last but not the least, the intermediaries and end users come together and play a cohesive role, the Indian Chemical sector can grow much more than the estimates.

Given this backdrop, Indian Chamber of Commerce (ICC) has organised this very important seminar involving most of the stakeholders. The objective is to facilitate dialogues and sharing of thoughts. FutureStation Advisors is happy to contribute in this endeavor as the Knowledge Partner to ICC.
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Chemical Industry: Global and Indian Scenario

Till 2006, the chemical industry hubs were USA and Europe. Together, they contributed to about 40% of the global chemical sales.

However, with the economic slowdown from 2008 onwards, there has been a major shift from the West to the East. The emerging economies performed much better than the developed economies. Over the last decade, the core of the chemical industry has shifted from the West to Asia, with China being the key benefactor. Manufacturers in the Asian region enjoy low people costs, relatively relaxed environmental norms and government subsidies.

The overall positive business scenario, during the same period, also resulted in huge capital investments and capacity built up in Chinese chemical industry. The economies of scale, cheaper people cost, availability of cost effective raw material sources have supported the growth story by keeping the costs low.

During this time, there has been a slow down in the economies of developed economies like USA, EU and Japan and investments either in capacity building or in R&D were limited. The stringent environmental regulations in developed economies also were seen as a road block to growth in the industry in the short run.

The success story of China has been phenomenal. They have relied not only on the huge domestic demand but they have emerged as the largest exporter of chemicals to USA and Europe. In 2018, they accounted for about 37% of the global sales.

The India story has so far been one of stagnant size. While there are plenty of challenges like poor infrastructure, lack of mature consumer demand in domestic market, difficulties in procuring feedstock, trade agreements that allow cheap imports, the industry has to accept its share of blame too. Investments in capacity building and R&D in the industry have not happened at par with the general economic growth in the country over the last few decades. As a result we have never been a serious player in the global market and we could not take advantage of the global economic slowdown the way China did.

While the growth in China can be attributed to favourable government policies and incentives, a rather relaxed environmental compliance requirement and overall growth in domestic demand as well as smart export initiatives, it is also a fact that they invested heavily on R&D during this period to come out with superior technologies products which is expected to continue to give them the edge.

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However, recent developments in policies, feedstock availability, trade wars between USA and China and societal concern on environment are some of the factors that can boost up India’s chemical sector significantly.
Chemical Industry: Let’s study the China Story

China’s growth in chemicals over the past two decades has been characterized by rapid investment and intense competition and fragmentation across large numbers of segments. This has particularly been the case where production technology has been widely available and where access to raw materials and financing has been easy to obtain. This combination has led to rampant overcapacity in many sectors. But the market and the industry are now moving into a new phase of development. There’s a shift toward specialty-chemical growth, reflecting consumer-demand trends and the rising sophistication of China’s industrial output, while consolidation has started to take a grip in certain sectors. These trends are all helping the value-pool growth prospects for parts of the industry. In the meantime, money for investment is harder to come by, and the government is imposing new, stricter environmental regulations on the industry.

Increasing economic turbulence since mid-2018, related to China’s economic slowdown and US–China trade relations, adds new uncertainties to the short term.

China’s chemical market dynamics:

- **Industrial policy and consumer trends stimulating demand for specialty products**
  The Chinese government’s Made in China 2025 policy is prioritizing a number of high-tech industries for development. The strategic directions it indicates could stimulate certain end markets, such as aerospace, electronics, electric vehicles (EVs), and batteries, which could, in turn, create opportunities for expanding production in China of a range of more sophisticated chemical products

- **Upgrading innovation and technological capabilities to strengthen the industry**
  China’s chemical-R&D spending is now among the world’s leaders. The structure of China’s chemical-industry R&D has also changed, moving from one in which initiatives were under government direction to one primarily driven by individual companies within an ecosystem of collaboration with government research institutions and universities—and that has a strengthened regime to protect intellectual property

- **Opening the industry up to new investors**
  Prior to 2015, petroleum refining in China had been treated as a strategic national industry to be controlled by state-owned oil companies. Naphtha crackers had also been under their control, and MNCs could only have a 50 percent stake. Since that date, however, refining and upstream petrochemical investments have been opened up to MNCs and more broadly to Chinese privately owned enterprises (POEs) to establish wholly owned operations.

- **Tightening of financing availability**
  The Chinese government’s policy to tighten credit across the country’s economy has been a particular handicap for the capital-intensive chemical industry that has in the past benefited from low-cost capital to expand capacity. Banks have shifted over the past year to demand more collateral, terminate loans prematurely, and refuse to renew loans, putting chemical companies at a further disadvantage for borrowing. Chemical enterprises also get charged an above-market-average interest rate.

- **New environmental regulations**
  China’s chemical buildup over the past two decades had prioritized growth over environmental quality. The 13th Five-Year Plan for environmental protection published in 2016 enshrining “clear waters and lush mountains” as a national policy has marked a sharp shift, as China’s authorities have started to address environmental degradation. While the new regulations are likely to force restructuring across significant portions of the industry, they could also present the potential for higher profitability for the companies that are able to manage under them and can absorb the higher operating costs that compliance will entail.
**Chemical Industry: What recent impacts do we see in China**

The domestic chemicals industry in China is witnessing a slowdown as a result of slower economic growth. Over the next 2-3 years, China’s GDP is projected to grow at 6-6.5%, against 8-10% witnessed over the last decade (2009-2018).

This slowdown would translate into lower offtake of specialty chemicals from large segments such as construction, automobiles, textiles and consumer durables. Increasing economic turbulence since mid-2018, related to China’s economic slowdown and US-China trade relations, adds new uncertainties to the short term.

**Trade Relations**: Factors such as global slowdown and the US–China trade war have also impacted the production growth in China. Currently, the US accounts for nearly 15% in China’s export basket. However, the continuation of trade war and resultant increase in tariffs could have negative implications for its trade and subsequently the domestic capacity and production in China. Many US MNCs are looking at shifting their manufacturing bases from China to other Asian countries. Major Chinese companies have revised their production plans, investments plans are on hold. The uncertainties are creating jitters among industry players and they do not know what more trade barriers are to be expected in future.

**Environmental Concerns**: The massive explosion at Tianjin Port’s chemical warehouse in 2015 that was visible from space was a loud testimony to the safety and health issues that plague China’s chemical sector. It is an open question if China’s economic growth justifies the environmental cost that the country has incurred.

The Chinese government started implementing stricter environmental protection norms from January 2015. In 2017, an estimated 40% of the chemical manufacturing capacity in China was temporarily shut down for safety inspections, with over 80,000 manufacturing units charged and fined for breaching emission limits. China’s Ministry of Environmental Protection enforced strict penalties on polluting industries, including chemicals. In 2016, the Government of Jiangsu, China, issued a development plan for the Yangtze River Delta Economic Belt. Pollution in the river had reached dangerous levels with several chemical manufacturers located near the river owing to proximity to ports. The government has set a goal of shutting down or relocating nearly 1,000 chemical plants, which use older technology or are located near the Yangtze River, within three years (2018-2020). By 2020, 134 chemical firms will be shut down, relocated or renovated. No factories will be allowed within 1 km of the river. Also, the Chinese government has mandated the construction of compulsory effluent treatment plants and imposed green tax on the chemicals industry to combat pollution. As a result, the overall cost of production has gone up with capital expenses incurred towards effluent treatment as well rise in compliance cost. The cost is expected to be higher for the smaller non-integrated plants operated by medium- and small-scale players. This is likely to impact production in the medium term and thereby overall chemical exports.

**People Cost**: The people cost in China was lower than that of India till 2007. However, over 2005-2015, the average people cost in China increased nearly 19-20% CAGR, against 4-5% CAGR in India. In fact, over the last five years, this cost has more than doubled compared with India, rendering Chinese manufacturers’ uncompetitive vis-à-vis India in terms of people cost.
Chemical Industry: The India Story so far

The India story has so far been one of stagnancy. While there are plenty of challenges like poor infrastructure, lack of mature consumer demand in domestic market, difficulties in procuring feedstock, trade agreements that allow cheap imports, the industry has to accept its share of blame too. Investments in capacity building and R&D in the industry have not happened at par with the general economic growth in the country over the last few decades. As a result we have never been a serious player in the global market and we could not take advantage of the global economic slowdown the way China did.

In an emerging market with close to annual economic growth of around 7-8% over the last few decades, the growth of the chemical sector has always been below the overall economic growth numbers. One reason for this can be attributed to the fact that India’s economic growth in last few decades have been propelled mostly by high growth in the service sector and not so much in manufacturing and infrastructure space which could have generated the domestic demand for chemicals.

The major challenges faced by the chemical sector in India are

1. **Shortage of raw materials.** The raw materials or feedstock used in the organic, as well as the inorganic chemical industry, are not quickly accessible in the market. The chief feedstock like naphtha and natural gas are accessible at a very eminent cost in India as contrasted to other nations like the Middle East, China, and other South East Asian countries. This shortage of feedstock makes India uncompetitive in the worldwide chemical market.

2. **Low entry barrier to import.** Competing on price with cheap imports from China and several other countries is difficult. Some countries are dumping specific chemicals into the country in a planned manner thus affecting our growth.

3. **Poor Infrastructural Facilities.** The significant Indian chemical industry has been established along the west coast in Gujarat, while the biggest need for chemicals is in southern and eastern India. This provides a rise in logistical transportation prices, thus enhancing the overall price of chemicals. In addition to that, there are various infrastructural difficulties encountered by the enterprise. The ports do not have sufficient facilities, the pipeline connectivity is considerably poor, the power supply is inadequate and even the railway stations are a disorder; considering it is challenging for the chemical industries to obtain the raw material from many chemical product vendors in India.

4. **Tax on import of raw materials.** The high import duty on certain raw materials do not encourage the sector

With all these challenges, Market size of the Chemicals industry in India stood at $163 bn in 2017-18. Total production of chemicals and petrochemicals stood at 47,882,000 MT during 2017-18, a 2.62% increase over 2016-17. Alkali chemicals had the largest share in the Chemical industry in India with approximately 69% share in the total production. Production of polymers account for around 59% of total production of basic major petrochemicals.

**Third largest consumer of polymers in the world**

**Fourth largest producer of agrochemicals in the world**

**Sixth largest producer of chemicals in the world**

Chemicals industry in India is highly diversified, covering more than 80,000 commercial products. It is broadly classified into Basic chemicals, Specialty chemicals, and Agrochemicals. India’s proximity to the Middle East, the world’s source of petrochemicals feedstock, makes for economies of scale.

India is a strong global dye supplier, accounting for approximately 16% of the world production of dyestuff and dye intermediates. Chemicals industry in India has been de-licensed except for few hazardous chemicals. Upcoming Petroleum, Chemicals and Petrochemicals Investment Regions (PCPIRs) and Plastic parks will provide state-of-the-art infrastructure for Chemicals and Petrochemicals sector.
India is steadily moving up the ranks as a global economic power and a business magnet for investment. Key drivers for success in the chemical sector include proximity to strong growth markets, greater ease in doing business, and the continued development of petroleum, chemicals and petrochemical investment regions (PCPIRs). Backed by one of the strongest GDP growth rates in the world, the future looks bright for the Indian chemical industry. India is currently outpacing China as the world’s fastest rising major economy. The country is the sixth largest economy by nominal GDP and the third largest by purchasing power parity (PPP). India is also on track to becoming the world’s third largest economy by the next decade and the second largest by 2050.

Indian chemical companies support a sizable and highly diversified industry that includes commodities, specialities, polymers, agrochemicals and a range of other groups. Total chemical sales are expected to grow at a much faster pace from US$ 163 billion in 2017-18 to US$ 304 billion by 2025.

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- Alkali chemicals had the largest share in the Chemical industry in India with approximately 69% share in the total production.
- Production of polymers account for around 59% of total production of basic major petrochemicals.
- The petrochemical market in India is expected to grow at a CAGR of 10% over the next 5 years to reach $ 100 bn by 2022.
- The market for crop protection chemicals in India is expected to reach $ 7.5 bn by 2019. This growth in demand is based on a rapidly growing population and a decrease in per capita availability of arable land, both of which result in a greater need to increase agricultural yield.
- The specialty chemicals market has witnessed a growth of 14% in the last five years; the market size is expected to reach $ 70 bn by 2020.

The Government of India has taken up the following very favourable initiatives to facilitate the growth:

- 100% FDI is allowed in the chemical sector under automatic route except for some hazardous chemicals.
- Setting up of PCPIRs. These are investment regions for petroleum, chemicals and petrochemicals alongwith associated services. Four such PCPIRs have already been approved.
- Setting up of Plastic Parks. Such parks will facilitate state of the art technology development as well as a conducive ecosystem to produce specialised plastic products.
- Skill development. Setting up of CIPET (Central Institute of Plastics Engineering and Technology), CoE (Centre of Excellence) in the field of petrochemicals, CPDS (Chemicals promotion and Development Scheme).
- The recent Union budget had few announcements that would positively impact chemicals:
  - The Indian Government’s vision will double farmers’ income along with announcement of 10,000 farmer producer organizations (FPOs) formation to boost agro-chemical companies.
  - The growing Indian construction and water chemical companies will further strengthen because of continued focus on India’s infrastructure (the Indian Government will invest Rs 100 lakh crores in next 5 years) and policies announced in this Budget (e.g., second phase of Bharatmala, public private partnership to build railway infrastructure, affordable housing under PMAY, upgradation of roads connecting villages to rural markets under PMGSY-III, Jal Marg Vikas Project for capacity augmentation of navigation on national waterways).
  - Income tax exemptions and indirect tax benefits to manufacturers of semi-conductor fabrication, solar photo voltaic cells, lithium storage batteries, solar electric charging infrastructure for making India a global hub of electric vehicles. This is expected to increase demand for silicon and lithium-ion batteries, and encourage investments by companies manufacturing lithium and silicon.
  - Reduction of Basic Customs Duty on: Naphtha falling under HSN 2710 reduced from 5% to 4%, Ethylene dichloride under HSN 29031500 reduced from 2% to 0%, Methyloxirane (propylene oxide) under HSN 29102000 reduced from 7.5% to 5%.
Chemical Industry: The India Outlook...contd.

Export trend over the years

Closure of plants in countries such as EU and China owing to increasing environmental concerns has opened doors for Indian manufactures to invest further in specialty chemicals. While India also faces threat from environmental concerns, the threat is limited to smaller players and shall serve as an opportunity for larger players to capture the market. In fact, some of the large players have established themselves in global markets like the EU and US and have active export revenue share, which will help them to seize the opportunity. This has boosted the exports of chemicals in the recent past.

However, the global event that possibly has the potential impact to boost India’s chemical industry is the recent and ongoing trade war between USA and China. If Indian chemical industry can take advantage of this appropriately, the growth potential is even higher than the projected numbers. This has come as a boon to us but we have to demonstrate or capability to capitalize on this opportunity with prudence, managing the environmental and social risk, with learnings from the Chinese experience.

- USA happens to be the largest market for Chinese chemical exports. The trade war between the two countries may result in USA looking for other exporters and India is definitely one potential benefactors from this.
- US chemical companies have massive manufacturing bases in China. They are looking at shifting the bases to other countries in Asia
- Due to environmental concerns, even many Chinese chemical companies are looking at importing from India instead producing in own country
Chemical Industry: Catalyst for growth - Sustainability

If we have learned from China’s experience, it is crystal clear that we need sustainable growth and we should not do the same mistakes that the Chinese did – the mistake of growth without managing the environmental and social risks.

The chemical sector has highest degree of environmental and social risk associated with it and hence all investment and operating decisions have be evaluated under he lens of sustainability no matter how profitable it may look on the face of it.

Today, 8.3% of all deaths and 5.7% of the total burden of disease worldwide are related to chemical exposure. This pressure is especially intense on chemists because ‘green’ and ‘chemicals’ are not words that have typically gone together. In fact, the perception today is that the chemicals industry is not doing enough to promote safe chemistry, despite the range of vital and interesting work going on in this area.

Aligning with the United Nations Sustainable Development Goals (UNSDGs), the World Business Council for Sustainable Development (WBCSD) has come out with a specific guideline for chemical industries to assess sustainability across its product portfolio. The guideline has been developed by involving the leading global chemical industries after the world saw the environmental and social damages of unplanned chemical industry growth in China. This guideline should be followed as much as possible and appropriate risk mitigation measures have to be taken. The Chemical Sector Sustainability Roadmap of WBCSD ([https://www.wbcsd.org/Programs/People/Sustainable-Development-Goals/Resources/Chemical-Sector-SDG-Roadmap](https://www.wbcsd.org/Programs/People/Sustainable-Development-Goals/Resources/Chemical-Sector-SDG-Roadmap)) may be referred in each step towards building new capacities.

The chemical industry’s journey to sustainability is in its early stages, and we can expect to see plenty of further improvement and innovation in the coming years. As the world’s population nears nine billion, and the strain on the planet’s resources grows, this will become increasingly vital. But in order to ensure that the future of better chemistry is a success, companies must invest in the necessary people, with the right skills and resources, including access to the latest digital and collaborative tools and technology. With that broad-level backing, the chemical industry can accelerate the development of sustainable solutions that meet the needs of society in the coming century.

With environmental and social regulations for the sector becoming more and more stringent, particularly with a view to exports in developed countries, our chemical sector has to come out with sustainable future-proof business models.
Chemical Industry: Catalyst for growth – Digital Empowerment

Barring the few leading companies, the chemical industry in general in India has not yet taken the advantage of digital empowerment. Business processes management, particularly sustainability, risk, production, supply chain et al can be managed more efficiently through use of Industry 4.0 which combines the connected technologies inherent in the Internet of Things (IoT) with relevant IT and OT, including analytics, additive manufacturing, robotics, high-performance computing, artificial intelligence, cognitive technologies, advanced materials, and augmented reality, to drive the physical act of manufacturing.

Few of the functions that Industry 4.0 can manage extremely well and efficiently could be:

- **Predictive Asset Management.** The asset intensity in chemical industries is very high and hence the tremendous difference that can be achieved.
- **Process Management & Control.** Digitization is only the first step, however. Industry 4.0 technologies such as real-time analytics and automated control actions bring together the digital and physical realms—supporting prediction, alerts, and prescriptive responses.
- **Energy Management.** Energy costs contribute significantly to a chemicals plant’s production costs. A typical plant involves multiple activities and their interactions, and it is difficult for operators to select optimal operating conditions without this level of automation.
- **Environment and Safety Management.** Given the sensitive nature of their products, it is particularly critical that chemicals companies manage the environmental and safety risks of their employees, supply chain partners, and customers throughout the product life cycle, from production to storage, transport, and end use. While traditional risk management methods involve monitoring and testing samples, connected technologies can help companies in continuously monitoring products, by-products, as well as any waste generated.
- **Production simulation.** Chemicals companies are increasingly using 3D visualization and virtual reality for training operators and maintenance staff. In addition to operator training and prognostics, 3D virtualization also helps operators prepare before the plant operations begin.
- **Supply Chain Planning.** Industry 4.0 helps chemicals companies plan their supply chains in two ways: first, by improving visibility into the supply chain; second, by predicting demand patterns.
- **Additive Manufacturing for Testing or Developing New Products.** Additive manufacturing (also known as 3D printing) uses information from the digital realm to create a physical product, encapsulating the IT/OT transition, potentially helping chemicals companies save costs during the R&D process. It allows designers to custom-build a reactor with specific geometrical configurations to control the chemical process within, as well as with the specific reaction kinetics or residence time of the chemical reaction.
- **Advanced Analytics for Selecting Materials.** Advanced analytics can help chemicals companies use digital information to create new “physical” materials.
- **4D Printing for Developing Advanced Materials.** Among many developments in advanced materials, one noteworthy example is that of programmable materials, also known as 4D printing.
About ICC

Founded in 1925, Indian Chamber of Commerce (ICC) is the leading and only National Chamber of Commerce operating from Kolkata, and one of the most pro-active and forward-looking Chambers in the country today. Its membership spans some of the most prominent and major industrial groups in India. ICC's forte is its ability to anticipate the needs of the future, respond to challenges, and prepare the stakeholders in the economy to benefit from these changes and opportunities.

Set up by a group of pioneering industrialists led by Mr G D Birla, the Indian Chamber of Commerce was closely associated with the Indian Freedom Movement, as the first organised voice of indigenous Indian Industry. Several of the distinguished industry leaders in India, such as Mr. B M Birla, Sir Ardeshir Dalal, Sir Badridas Goenka, Mr. S P Jain, Lala Karam Chand Thapar, Mr. Russi Mody, Mr. Ashok Jain, Mr. Sanjiv Goenka, have led the ICC as its President. Currently, Mr. Rudra Chatterjee is leading the Chamber as its President.

ICC is the only Chamber from India to win the first prize in World Chambers Competition in Quebec, Canada.

ICC's North-East Initiative has gained a new momentum and dynamism over the last few years. ICC has a special focus upon India's trade & commerce relations with South & South-East Asian nations, in sync with India's 'Look East' Policy, and has played a key role in building synergies between India and her Asian neighbours through Trade & Business Delegation Exchanges, and large Investment Summits.

ICC also has a very strong focus upon Economic Research & Policy issues - it regularly undertakes Macro-economic Surveys/Studies, prepares State Investment Climate Reports and Sector Reports, provides necessary Policy Inputs & Budget Recommendations to Governments at State & Central levels.

The Indian Chamber of Commerce headquartered in Kolkata, over the last few years has truly emerged as a national Chamber of repute, with full-fledged offices in New Delhi, Mumbai, Guwahati, Ranchi and Bhubaneshwar & Hyderabad functioning efficiently, and building meaningful synergies among Industry and Government by addressing strategic issues of national significance.

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About FutureStation

FutureStation is a multidisciplinary professional services firm set up by highly experienced professionals with 25 to 30 years of advisory service experience in India as well as Globally. Though set up not so long ago, the firm has already served several clients in India as well as Bangladesh, UAE and Austria.

The four competencies of FutureStation at present are
- Sustainability
- Digital Empowerment
- Risk Advisory
- Human Capital

Through associations with firms set up in Europe, USA and Middle East by former leaders of Big 4 firms, Oracle, SAP and similar professional firms, we have enhanced our capabilities to serve clients in different global markets while enhancing our capability to serve clients in India.

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