

VP Presentation on Changing Dynamics of Chemical Industry

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China – The Global Behemoth of Chemical Sector

- China's Chemical Market Size – USD 3.50 trillion (35% of the global market) – largest in the world
- Exports – USD 200 billion of chemicals including USD 130 billion of speciality chemicals from China – more than 10 times the size of exports from India

(source: Mr. KA Ramakrishnan, Head of Chemical Practice and Partner, Avalon Global Research – Interview in Philip Capital Ground View India 2018 Edition)

- In some of the segments of Chemical sectors like dyes, pigments, agrochemicals, pharma APIs – China has almost 70 – 80% market share of the world

Reason for China's dominance

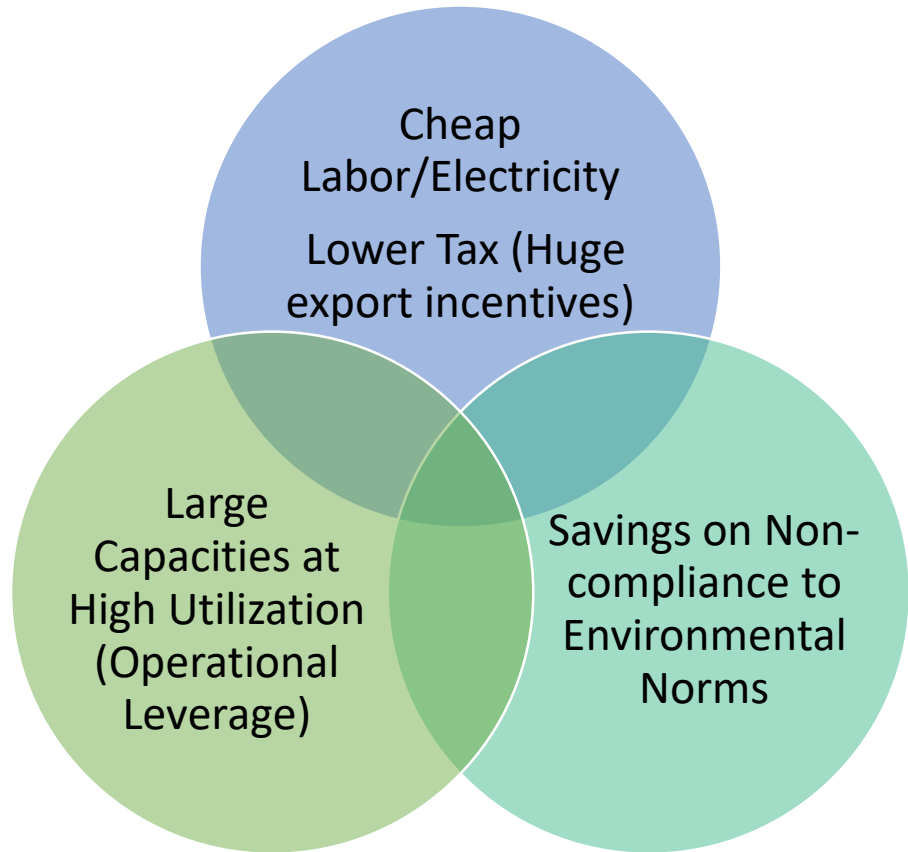
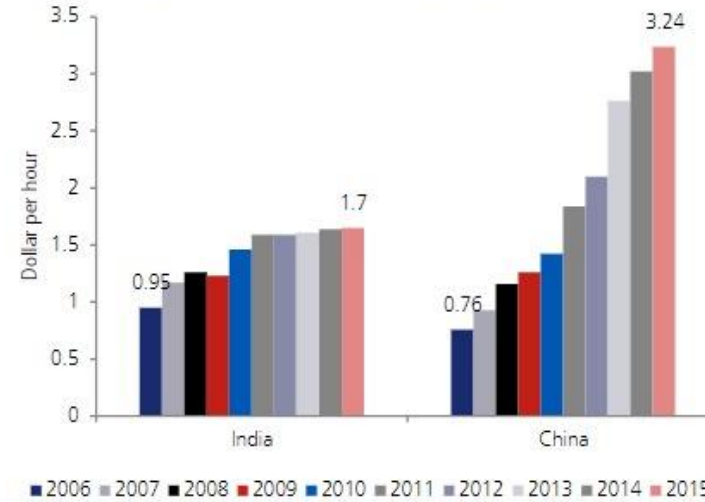
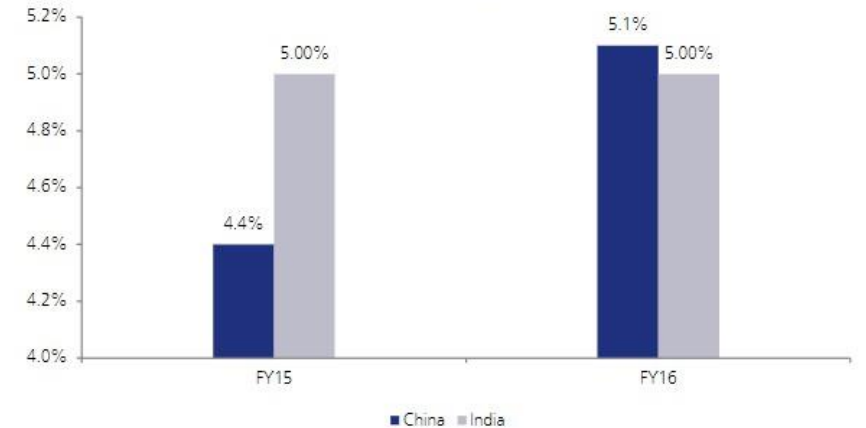


Exhibit 19. Hourly labour cost (productivity adjusted) – India Vs. China



Source: The conference board, World Bank, JM Financial

Exhibit 28. ETP opex cost as a % of sales incurred by Chinese vs Indian companies*



Source: Company, JM Financial *companies – Tsaker Chemical, Zhejiang Longs, Zhejiang Runtu Co, Lianhe chemical technology, Lier chemical, Jiangsu Chang

Operation Blue Sky

- Change in Government's policy from 'Growth at any price' to 'Sustainable growth without impacting environment'
- Chinese Government started implementing stricter environmental protection from January, 2015. The norms have got stricter every passing year
- The Government is extremely serious about the pollution issues that:
 - It has hired thousands of environment officers to keep a check on polluting industries
 - The officers even demolished coal fired heaters installed in houses this winter near Beijing leaving millions of people suffering
 - Taken steps to move industrial traffic from road to railways

Impact on Chemical Industry in China

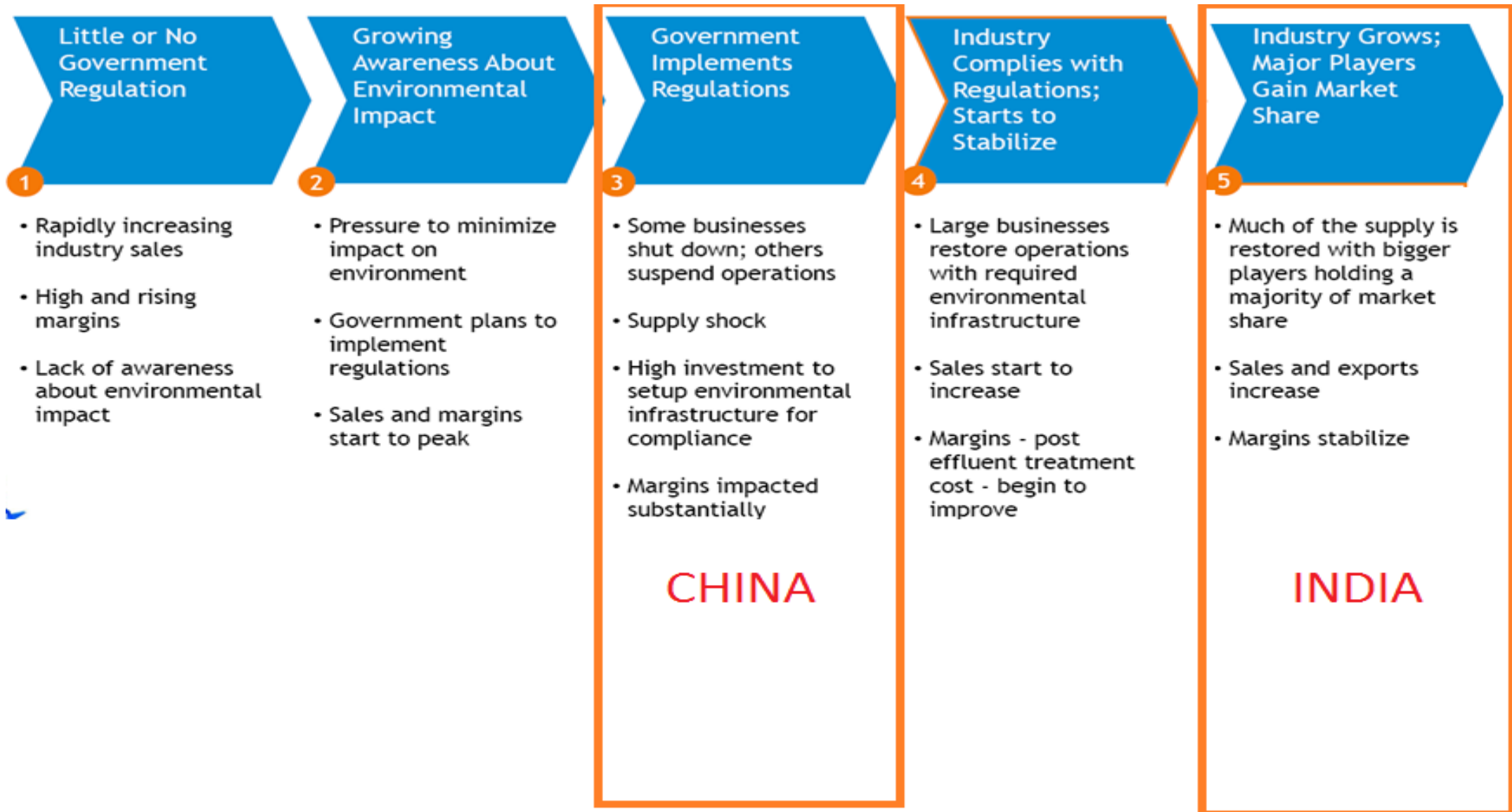
- Implementation of strict penalties for not following the norms
- Shift towards gas based power plants from coal based ones
- Compulsory Effluent Treatment plants to be set up
- Made mandatory for all polluting industries to operate from industrial clusters away from habitat
 - Small to mid-size chemicals plants to relocate by the end of 2020.
 - All larger plants must relocate by the end of 2025 and must start the process by no later than 2020

Cont...

- Taxes to be levied on polluting industries based on pollution type, location and severity.
 - Air pollution fees will run 1.2 yuan (\$.18 US) to 12 yuan (\$1.81 US) per pollutant equivalent value
 - Noise pollution will run from 350 yuan (\$52.69 US) up to 11,200 yuan (\$1,686.04 US) per decibel in excess, depending on location and severity
- Putting pressure on government officials and even politicians to take effective steps
 - If a city does not achieve 60% of the emission reduction target, the city's vice mayor will be held responsible
 - If the city achieves less than 30% of its target, the mayor will be held responsible
 - If the PM 2.5 level ends up increasing instead of falling over the winter, the party secretary of the city will be held responsible
 - If a Government Official fails to take action against a polluting company, officials are jailed and fines levied on them. On July 9, 2018, a total of 4,305 officials in 10 provinces and regions had been brought to book for failing to rectify violations, with many of them facing heavy fines and prison term.

Thousand of small and mid sized chemical companies have been closed down over the past three years. Export of chemicals from China has declined in double digits over the past two years.

Regulatory impact on Chemical Industry



What if the supply comes back from China?

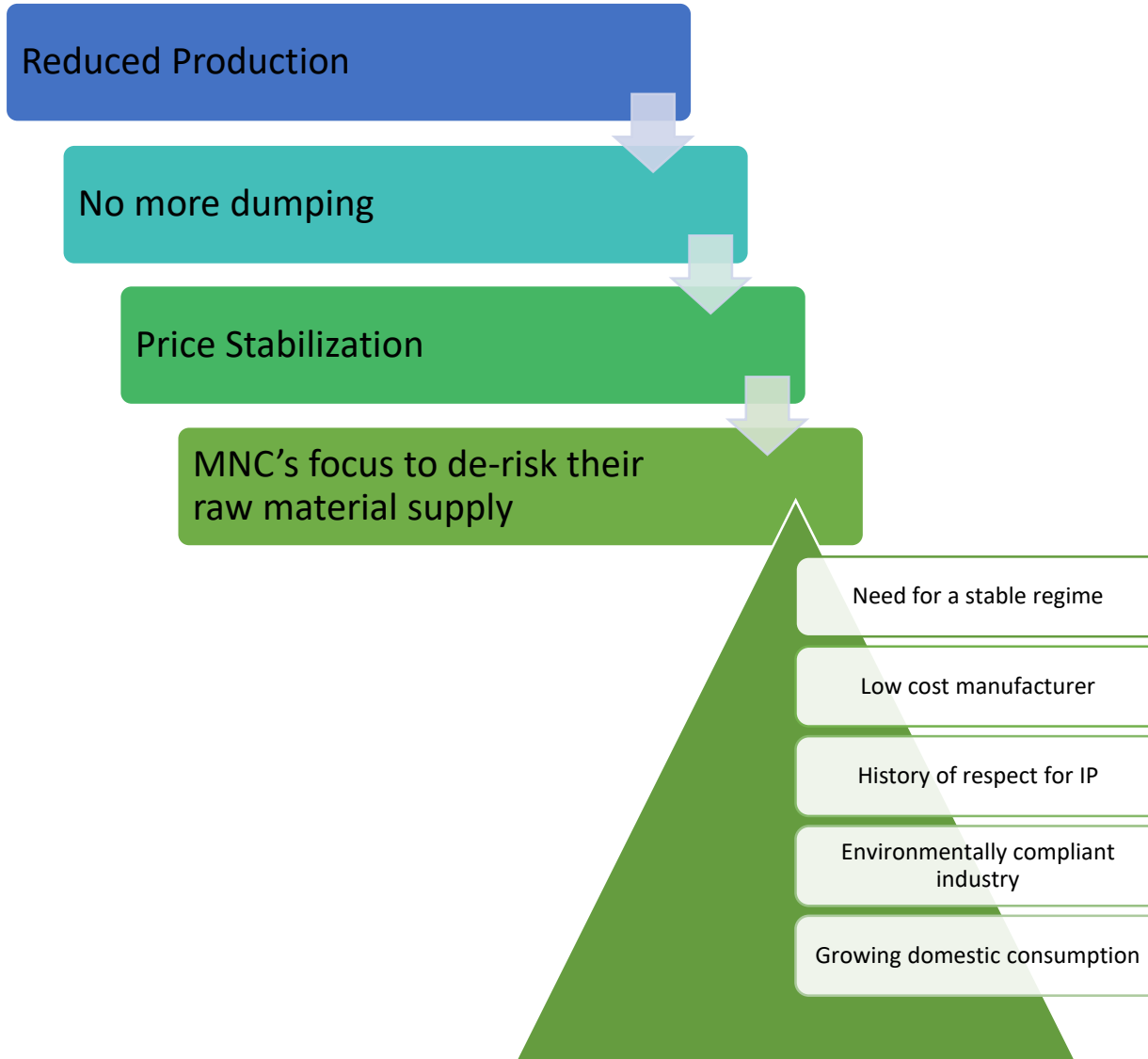
- Let's assume the supply comes back from China as many industries shift to Mongolia or other far-off cities. However, some structural changes will take place impacting the cost competitiveness of China:
 - Natural gas to be used in place of coal leading to increase in power cost
 - Effluent treatment cost to increase significantly
 - Labour cost to increase due to shift towards
 - MNCs looking to develop an alternate source for procurement to tackle supply issues from China

India – an alternate choice

- India can become a major beneficiary of the ‘Green’ issues in China:
 - Availability of low cost and skilled labour
 - Already has strict environmental policy in place
 - Strict IPR
- Not just export opportunity but also stability of prices on account of lower dumping from China
- India’s export of chemicals grew by 31% on a y-o-y basis during FY18 with inorganic, organic and agro chemicals growing by 38% (source: Chemexcil)

‘Earlier China used to manufacture 80% of the technical requirement of agrochemical companies and 20% was manufactured in-house by MNC. Post the environmental issues in China, 20% of the capacities will move to India from China by MNCs’ – Bharat Rasayan in recent interview

Impact on Indian Chemical Industry



Some shift to India already visible

This is to inform that the Company has executed a Long Term Supply Agreement with an unrelated global customer for the supply of one or more of the existing products of the Company. The supply under this agreement is expected to commence from 1st January 2018 and this agreement is for a period of 10 years, subject to the terms and conditions contained therein.

Depending on the volume requirements of the customer, it is expected that this contract may have a positive effect on the turnover of the Company (in a full year of operations) to the extent of 60% to 70% as compared to the turnover of FY 2015-16.

Transpek tie up with Dupont for manufacturing of polymer chemical

Aarti Industries signs a 20 years exclusive contract worth ₹ 10000 Cr for supply of high value chemical

Mumbai, December 29, 2017: Aarti Industries Ltd (AIL) today announced that they have signed ₹ 10000 Cr multi-year exclusive supply contract with a leading global chemical conglomerate (customer). This contract entails supply of a high value speciality chemical intermediate over a period of 20 years. The supplies are expected to commence from 2020 with an estimated revenue generation of ₹ 10000 Cr over the contract period. With this deal, AIL is set to enter a new chemistry range, first of its kind in India; and its end product is amongst the major growth initiatives for the customer.

Aarti Industries signs Rs. 4,000 crore multi-year deal with a Global Agriculture Company for supply of an agrochemical intermediary

Aarti Industries Ltd (AIL), a leading global Speciality Chemicals company, announces that it has entered into a multi-year contract with a global agriculture company, (hereinafter termed as "Customer") to supply a high value agrochemical intermediary.

The contract entails supply of a high value agrochemical intermediary, for use in herbicides, over a 10 year period. The supplies are expected to commence from FY20 and would generate expected revenues of approximately Rs 4,000 crores (approximately USD 620 million) over the contract term. The project will entail investment of about Rs 400 crores (approximately USD 62 million) by AIL. The end-use is amongst the major growth initiative of the Customer and approximately US\$ 1 billion is being invested for this project/initiative.

From a listed company perspective

‘The total market capitalisation of all the listed chemical companies in India (excl. Pidilite) is less than 1% of market capitalisation of all the companies’

What are the Indian Chemical cos indicating about these opportunities?

- In the FY18 ARs of chemical companies released till date, all of them have highlighted about the opportunities emerging because of issues from China.
- Some of the snippets:

Prices of agrochemicals like insecticides and herbicides are likely to go up with shut down of many factories in China, the world's largest producer of agrochemicals, due to tightening of pollution control norms. Indian players, who have manufacturing strength, especially with backward integration, will have opportunity to emerge as global players. This will be a boost for the 'Make in India' initiative of the government.

- *Excel Crop Care*

Western and Japanese customers have a clear strategy to derisk their supply chain from China and this will result in significant increase in demand for our products. Astec is well positioned to take up the position of a reliable supplier and will further expand capacities during the current year to meet the increased demand.

- *Astec Lifescience*

This is a golden period for Indian speciality chemical companies. MNCs are more and more looking at India as an alternate source due to issues in China. The Government in China is not issuing new licences for chemical companies and many speciality chemical companies have closed down.

- *Aarti Industries*

Cont...

With China shutting off its capacities on pollution concerns, the global market is looking out for substitutes for constant and affordable supply of raw material for agro chemical and other fine chemical products. This phenomenon may potentially unfold high growth opportunities for Indian CRAMS players. CRAMS model works well especially when the end-products are patented or enjoy exclusivity. The

Rallis

Although dependency on China could clearly see the implication in shortage of supply and API prices going up, year 2017 also saw several formulators and API manufacturers looking for alternatives in India, Europe and the US for advanced intermediates and the APIs. We expect this to be an opportunity for Hikal as a reliable and compliant company.

Hikal

Rising environmental concerns and stricter government actions are leading to consolidation and uncertainty in the chemical industry of China. This is leading global innovators to revisit their outsourcing strategy, thereby offering great opportunities for PI with its unique business model.

PI Industries

Cont...

Due to steady global demand and significant reduction in production of Chemicals in China, the overall outlook for Indian Chemical Industry is looking very positive. In addition, the "Make in India" initiative of the Indian Government should provide

Transpek

change the landscape we have known for so many years. The crackdown on polluting industries in China has pushed increased demand toward India's agrochemical and dyes manufacturers who are rapidly expanding to ensure a sustainable competitive advantage. The global hunt intensifies for partners in developing countries that share similar values of responsibility and Environment Health and Safety (EHS) competitively.

Deepak Nitrite

adhesives, dyes etc. Major growth drivers for the business were exports of agrochemicals and pharmaceuticals actives as India is becoming a global manufacturing hub for pharma and agrochemical active ingredients. During

BASF India

However, issues on raw material front for companies

The growth was achieved in spite of the several challenges we faced during the year, particularly in the disruption of supplies and the cost increases in raw materials originating from China.

Hikal

Indian crop protection companies import a significant portion of their technical requirements from China. As a result, prices of some essential raw materials used in agrochemicals increased in the range of 50% to 70%. The implementation of

Rallis

Your company's exports grew marginally by 1.2 % during the year despite a slowdown in the global market situation and challenge in availability of raw material especially from China. In order to reduce its dependency on Chinese raw material suppliers, the company has developed 6-7 alternate vendors in India for 6-7 key raw materials that shall help the company in the coming years.

PI Industries

The major benefit of the issues in China will be to companies who have presence in export markets or who are/trying to be fully backward integrated with ability to manufacture intermediates

Basic Chemicals vs Speciality Chemicals

Parameters	Basic Chemicals	Specialty Chemicals
Qualitative		
Product type	Specification based	Performance/functional product
Structure	Simple molecular	Single molecule/formulation
Production	Continuous	Mainly batch
Price determination	Supply – demand balance	Performance
Volume and Value	Medium to high volume products with lower price realisations	Low to medium volume products with higher price realisations
Value addition	Low to medium	Medium to high
Plants/Facilities	Costly, not able to vary product	Small, inexpensive, able to switch products
Labor requirements	Minimal, rely on automation	Costly, rely on innovation
Key Success Factors	Access to secure and cost-efficient raw material, operational efficiency	Strong R&D leading to new product development, high performance-to-price ratio

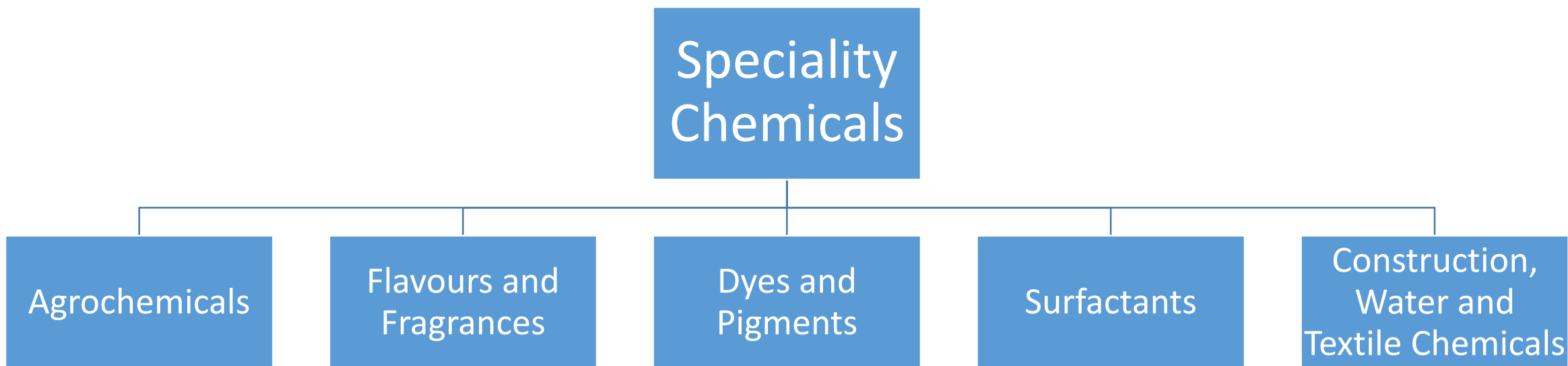
Source: JM's report on Speciality Chemicals dated Sep. 28, 2017

80% of world's chemical market is of basic chemicals and rest is speciality chemical

Supply constraints leading to higher prices of basic chemicals – Is it sustainable?

- Lot of basic chemicals seeing increasing supply due to demand constraints
- **Import substitution:**
 - Deepak Nitrite – Huge expansion for manufacturing of Phenol and Acetone
 - Phenol and Acetone are basic chemicals used in manufacturing of plastics, agrochemicals, pharmaceuticals, solvent etc
 - Most of the phenol and acetone is imported in India and the demand for both the products is growing by 10 – 12% p.a.
 - Deepak Nitrite is putting up a plant to manufacture phenol with capacity of 200 KTPA and acetone with capacity of 120 KTPA – These would replace 65% of total imports of both the chemicals in India
 - *Project to be completed in the current year but stabilisation risk remain*
- Prices of lot of chemicals have increased – Vitamin D (DIL Ltd), Caustic Soda etc – Sustainability is a question mark!

Types of speciality chemicals

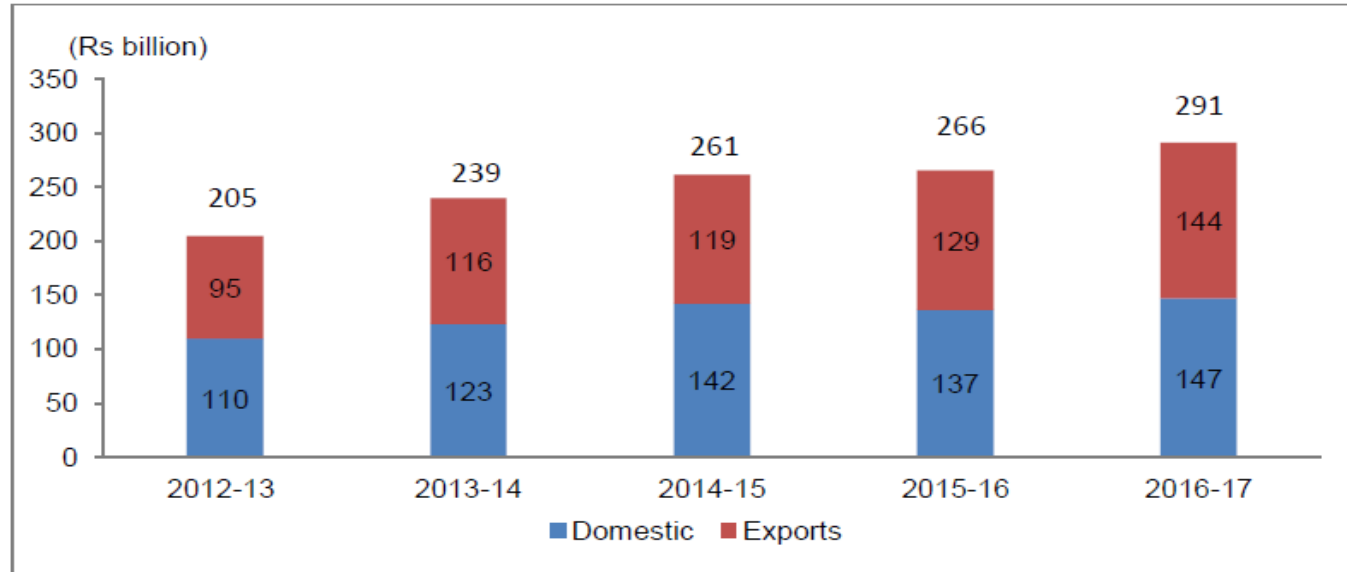


Agrochemicals

- Global agrochemical market is valued USD 61 billion during 2017. Last few years have been tough for the industry with the markets declining from USD 66 billion during 2014
- Highly consolidated market with ~70% market share with Syngenta, Bayer, BASF, Dow, Monsanto and DuPont. Further consolidation with merger between ChemChina-Syngenta – Adama, Dow – Dupont and Bayer - Monsanto
- Post patent products contributed 66% of the overall markets currently as against 30% of the overall agrochemical markets in 2000
- ***USD 25 billion of patented products becoming off-patent over the next three years***

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- **Size of Agrochemical Industry in India:**



Source: CRISIL Research

- India has around 120 – 150 technical manufacturers and around 800 formulators. Technical is an active ingredient in a formulation. Not much manufacturing capability is required for manufacturing of formulation (its more about marketing as its B2C) while for manufacturing technical, a company requires chemistry skills. ***More the backward integrated a technical manufacturing company is (manufacturing of intermediates), better it is given the issues in China.***

A big opportunity for technical and intermediate manufacturers in India

- India imports USD 0.90 – 1.0 billion of technical and intermediates from China
- Huge supply issues for Indian formulation manufacturers for the past two years – Many of them were not even able to supply finished products
- MNCs looking to diversify:
 - China is the largest exporter of agrochemicals in the world with India being the fourth largest player.
 - Currently, 80% of the requirements being fulfilled by China in many of the agrochemicals and remaining in-house by MNCs – this ratio might shift towards India – Apart from pricing, supply consistency is an issue

Some companies which might be beneficiaries of the demand uptick

PI Industries

- Excited more by the CSM segment of the business where the company manufactures technical for global innovators
- One of the few companies in India which works with innovators in agrochemical segment during development as well commercial stage. Has established relationship with most of the large innovator companies
- Healthy order book of more than USD 1 billion which has increased over the past two years
- Entering new segments like fine chemicals, electronic chemicals etc which might open new avenues for the company having

Cont...

- **Astec Lifescience**

- Godrej Agrovvet acquired stake in the company during FY16
- The company is engaged in manufacturing of technical and intermediates. It took a strategic step of backward integrating by getting into manufacturing of intermediates during the past one year

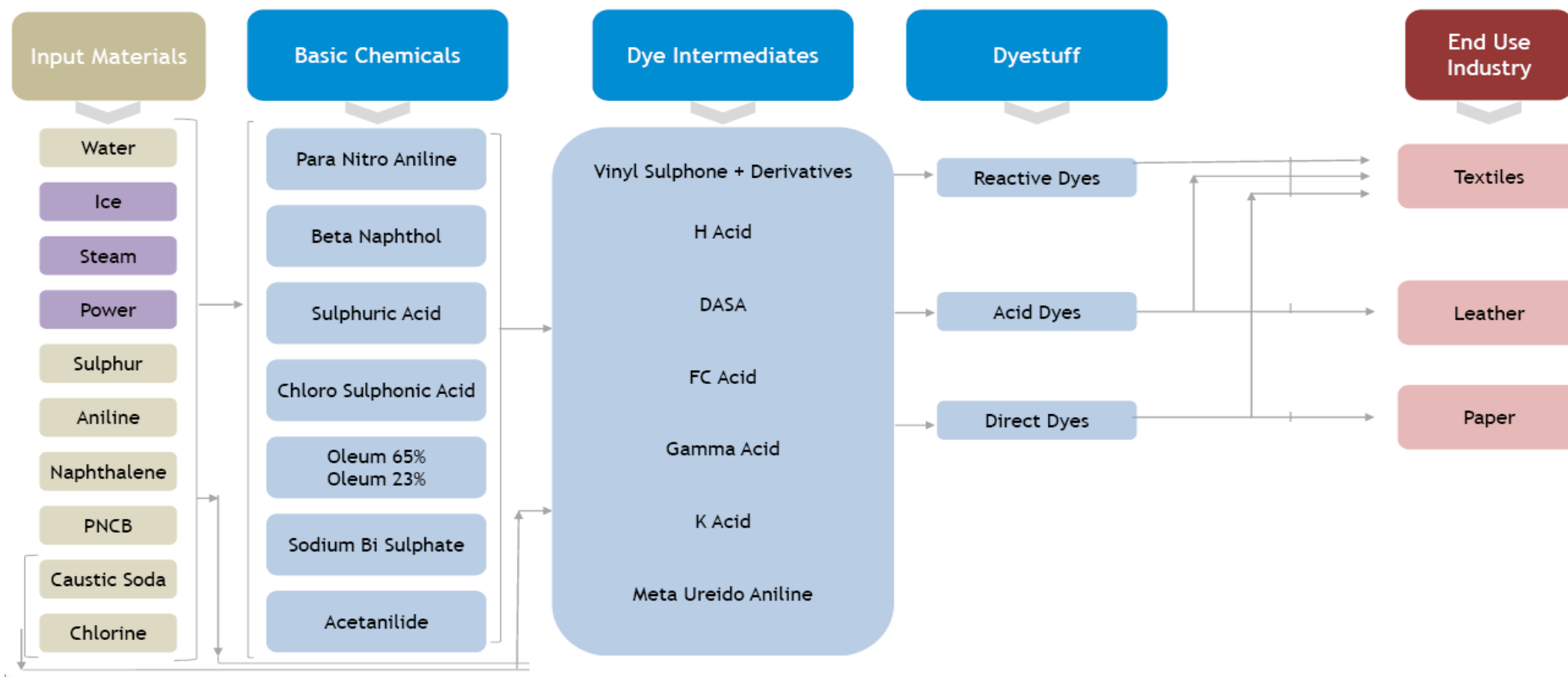
- **Bharat Rasayan**

- The company is engaged in manufacturing of technical and intermediates
- Known for its quality and admired even by its peers
- Getting into manufacturing of patented molecules for innovators

- **Excel Crop Care**

- Acquisition of stake by Sumitomo opens lot of new avenues for the company

Dye Chemicals – Another big beneficiary!



Dye Stuff/Intermediates

Crude-> Benzene/Toluene-> Nitro-aromatics -> Dye Intermediates-> Dyestuff

Caustic, Nitric Acid, Acetic Acid are other RM.

Crude price changes impact this whole chain significantly. Integrated players are comparatively insulated/will be least impacted. There is a lag of few months as price hike upstream flows through the chain.

Whenever dye prices increase, people tend to order less and start consuming their inventory. So, unless, price rise is for substantial duration, there is not much impact on numbers.

Dye intermediates prices are standard across board meaning it is plain commodity. Dyestuff prices on other hand vary depending upon quality, color, and other parameters.

Dye intermediates industry is highly polluting. Dyestuffs comparatively less polluting.

H Acid and Vinyl Sulphone complement each other. Waste of one feeds into producing other. Therefore, for standalone H acid plant, effluent treatment is much more costly.

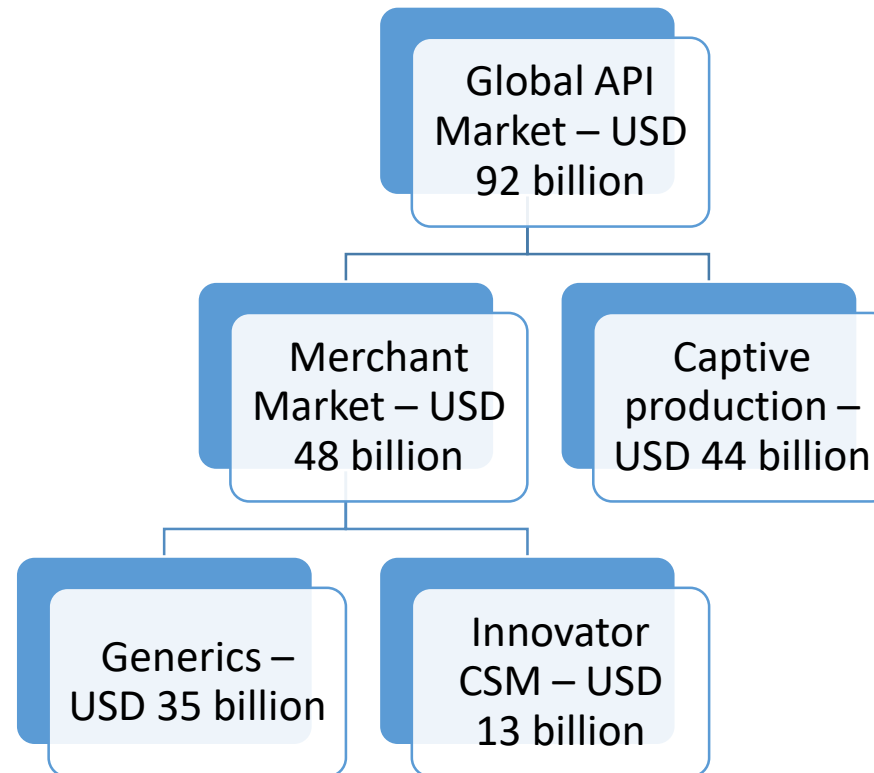
Dyestuff is much bigger market than the intermediate market and the environmental challenges are also lesser

Dye intermediate manufacturing only happens in India and China. Not much capex is coming online as permissions are difficult to get

- In Gujarat, the government has restricted VS and some of the other intermediates to only Dahej. I don't see the market flooding with any new capacities or any new products in the next at least 2-3-5 years, unless any new area develops where you can establish these plant, which is practically not really possible as most of the RM are very hazardous and not easy to export-import between countries. And production doesn't take place in every continent. So the new capacities or a transition to another location or a comeback from Chinese companies with new capacities is very unlikely.
- Bullish on dyestuff prospects due to global factors (East Asia). They don't have dye intermediate plants and were dependent on imports. Now, with China curbs, those countries are getting unviable. So, in long run, dyestuff players that are integrated upstream will survive.
- Indians companies getting almost same realization for exports and domestic market. Earlier, China used to dump, which is not happening now. So, Indian dyestuff capacity is getting absorbed domestically.

Pharmaceutical and Animal Health APIs

- Global Pharma API market is estimated at USD 92 billion



Source: European Fine Chemicals Group

Cont...

- China is the largest producer of APIs and intermediates covering 40% of the world's production while India is the third largest generic API player with 7.2% market share globally
- **India imports around 80% of its API and intermediate requirements from China**
- The crackdown has resulted in shutting down of 40% capacity in China and resulting in shortage of many of the molecules
- Prices of basic APIs like paracetamol, azithromycin, ciprofloxacin, ofloxacin has increased a lot
- An API player can have advantage either by '*Manufacturing common APIs at large scale or venturing into niche, complex molecule*'

Some companies which might be beneficiaries of the demand uptick

- **Aarti Drugs**

- Part of the Aarti group with flagship company – Aarti Industries being one of the largest speciality chemical company in India
- Amongst the largest player in the world in some of the molecules across antibiotics (ciprofloxacin), antifungal (ketocanazole), anti-inflammatory, cardioprotectant segment
- Focused more on domestic market with 63% contribution

- **Hikal**

- Present across both agrochemical and pharma API segment – present across innovator and generic molecules for both the segments
- Established relationship with large innovator companies across agrochemical and pharma space

Cont...

- **NGL Finechem**

- Present in veterinary API markets and serving to unregulated markets which are growing in double digits
- Expanded capacities during FY18 and already received EC approval for next expansion

Other interesting companies in speciality chemical segment with niche products

- Aarti Industries
- Atul Ltd
- Navin Flourine
- SRF
- Oriental Carbon
- NOCIL