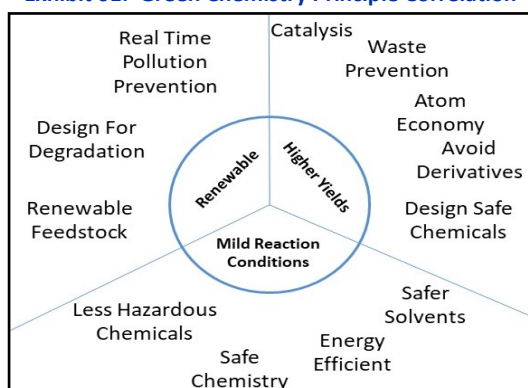


About the Industry:

Green chemistry basically aims at reduction of waste, atomic and energy savings and use of renewable raw materials. The fundamental principles include prevention of (chemical) accidents, less hazardous chemical syntheses, explore atom economy, designing safer chemicals, solvents & auxiliaries, design for energy efficiency, use of renewable feedstock, reduce derivatives, focus on catalysis, real-time analysis for pollution prevention etc. Green chemistry aims at products and processes that have similar or superior properties, when compared to conventional fuel based products and processes, for a cleaner and better eco system. The sole crux of the green chemistry industry is to find solutions for stability, reusability, continuous operation, value add to products, use of alternative and renewable reagents that reduce material loss and waste generation, substitution of toxic materials or solvents, improvement of natural synthesis or processes, minimization of energy consumption and the study of new substances that do not pollute the environment. The need to find sustainable development is not just to reduce the impact of economic activity on the environment; but also to improve the quality of life and well-being of society in the present as well as the future where circular and sustainable economies have become a major strategic challenge. The green chemicals market is predicted to grow at a CAGR of roughly 9.10% from ~USD9.89bn in 2021 to reach USD16.68bn by 2028 where, Europe is projected to dominate the worldwide market. One key feature of green chemistry that many players are still learning and building-on is the use of **biocatalysts**, which employs small quantities of biocatalysts (instead of rare and toxic transition metals) to enable reactions. Despite the efforts deployed over the last 2 decades, green and sustainable chemistry is still niche in both the academic chemistry community as well as in the chemical industry. This acts as a **barrier to entry** to green and sustainable chemistry, its innovation and commercialization. Some of the few players, who are developing these portfolios are trying to support sustainability tailwinds for electric vehicles (EVs), energy storage, water reduction, energy efficiency, use of natural ingredients and laying more emphasis on circular economy.

Exhibit 01: Green Chemistry Principle Correlation



Source: sciencedirect.com/science/article/pii/S2666086521001958 , Progressive Research

What is PTC? A phase-transfer catalyst (PTC) facilitates the migration of a reactant from one phase into another where the reaction occurs. PTC generally offers faster reactions with higher yields, makes fewer by-products, eliminates the need for expensive solvents, eliminates the need for expensive raw materials, and minimizes waste problems. PTCs are extensively used by the Pharma industry for synthesis, R&D, formulations, and laboratory applications. On the basis of **type**, PTC market is segmented into ammonium salts, phosphonium salts, crown ether and cryptand. On the basis of **end-user**, PTC market is segmented into pharmaceuticals, agrochemicals, and others. The global PTC market is anticipated to expand at a CAGR of more than 5% where rising demand and adoption of green chemistry in organic synthesis is expected to drive the growth.

SNAPSHOT				
52 week H / L		Mcap (INR mn)		
2976 /2001		48713.27		
Face value: 10				
BSE Code		NSE CODE		
543321		TATVA		
Annual Performance				
(Rs mn)	FY20	FY21	FY22	FY23E
Total Revenue	2,632	3,004	4,336	5,210
EBITDA	550	657	1,082	1,302
EBITDA (%)	20.9	21.9	25.0	25.0
Other Income	14	59	89	89
Interest	39	42	48	60
Depreciation	48	67	82	103
PBT	476	607	1,041	1,228
PAT	378	523	959	1,019
Equity (Rs mn)	80	201	222	222
EPS (INR)	47	26	43	46
Quarterly Performance				
Parameters (Rs mn)	Jun-21	Sept-21	Dec-21	Mar-22
Sales (Net)	1,068	1,236	1,047	985
EBITDA	258	359	238	220
EBITDA (%)	24.2	29.0	22.7	22.3
Other Income	30	28	47	4
Interest	26	12	10	12
Depreciation	19	21	21	21
PAT	230	324	228	175
Equity (Rs mn)	201	222	222	222
Ratio Analysis				
Parameters (Rs mn)	FY20	FY21	FY22	FY23E
EV/EBITDA (x)	89.9	75.2	45.5	37.8
EV/Net Sales (x)	18.8	16.5	11.4	9.4
M Cap/Sales (x)	18.5	16.2	11.2	9.3
M Cap/EBITDA (x)	88.6	74.1	45.0	37.4
Debt/Equity (x)	0.81	0.56	0.25	0.21
ROCE (%)	37.3	36.3	31.9	24.0
Price/Book Value (x)	15.0	26.6	10.3	8.5
P/E (x)	46.7	84.4	50.8	47.7
Shareholding Pattern as on 31 March, 2022				
Parameters	No of Shares	%		
Promoters	1,75,48,258	79.17		
Institutions	24,77,447	11.18		
Public	21,39,357	9.65		
TOTAL	2,21,65,062	100		

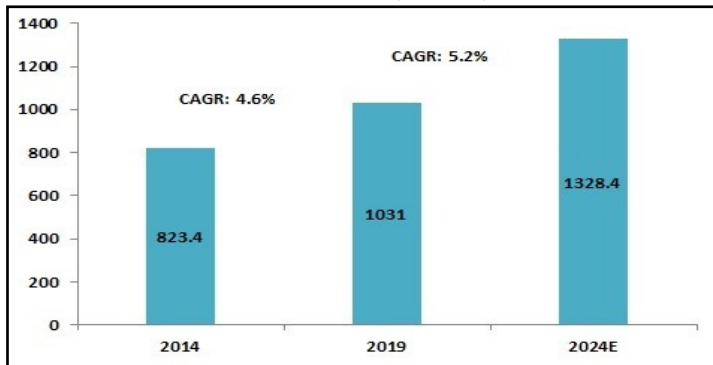
Source: Annual Report, Progressive Research

Note: Data is calculated as on 17 June, 2022

About the Industry (contd.):

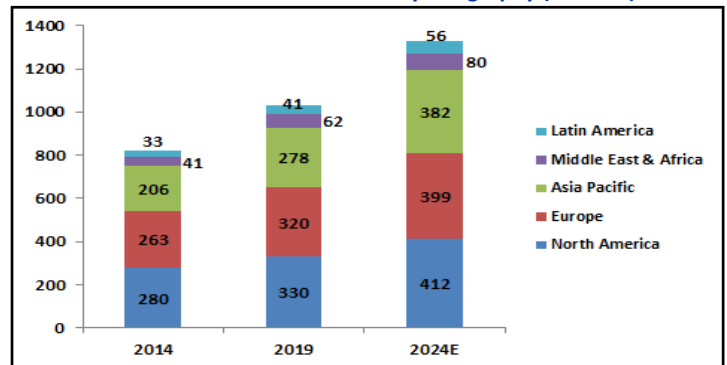
The key manufacturers in the Indian market are Tatva Chintan, Dishman Group, Delta Finochem, Pacific Organics Private Limited, Otto Chemie, TCI Chemicals and a few other smaller players, where Tatva Chintan, Delta Finochem, Dishman group and Pacific Organics Private Limited are the major players in the export market, with Europe being the leader in terms of imports from India. Most chemical and pharmaceutical companies import from the market leaders from India. Indian players also have their establishments across the globe for ease of trade. PTC have evolved over the years and the future of the product is expected to be bright, not through its simple extension to old chemical reactions but because it provides a tool to handle future chemical problems in highly material and energy efficient ways.

Exhibit 02: Global PTC Growth Trend (USD mn)



Source: Frost & Sullivan, RHP TCPL, Progressive Research

Exhibit 03: Global PTC Growth Trend By Geography (USD mn)



Source: Frost & Sullivan, RHP TCPL, Progressive Research

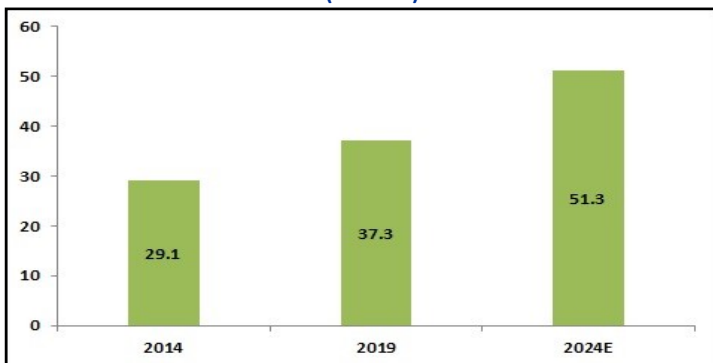
Exhibit 04: Country Specific CAGR Growth

CAGR	North America	Europe	Asia Pacific	Middle East	Latin America	India
2019-24	4.5%	4.6%	6.5%	5.2%	6.3%	6.6%

Source: Frost & Sullivan, RHP TCPL, Progressive Research

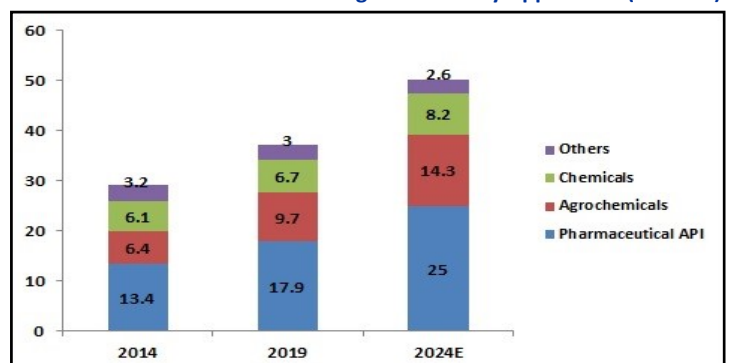
Indian PTC Market: is currently valued at a little over USD37mn which is driven by growth of end user industries like pharmaceuticals and agrochemicals while accounting for ~3.5% of the global PTC market. With a few large manufacturers on a global level, India is keen on exports thereby aiming to improve its market share with the help of multiple initiatives from the government. India is looking at a growth in demand of ~6.5% CAGR thereby trying to increase its market share to ~4% by 2024E. With the positive growth that the industry experienced, the demand for PTC has also grown in India.

Exhibit 05: Indian PTC Market (USD mn)



Source: Frost & Sullivan, RHP TCPL, Progressive Research

Exhibit 06: Indian PTC Market Segmentation By Application (USD mn)

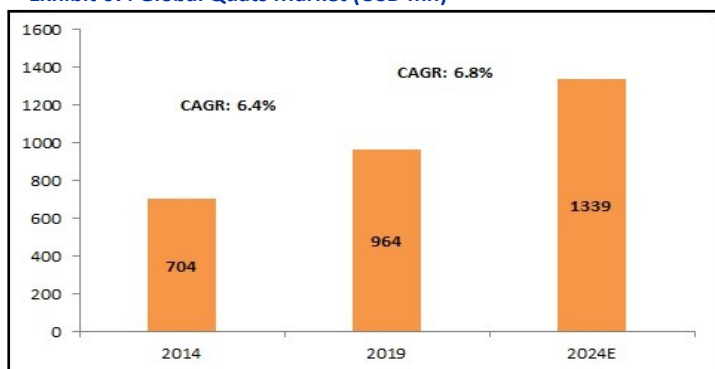


Source: Frost & Sullivan, RHP TCPL, Progressive Research

About the Industry (contd.):

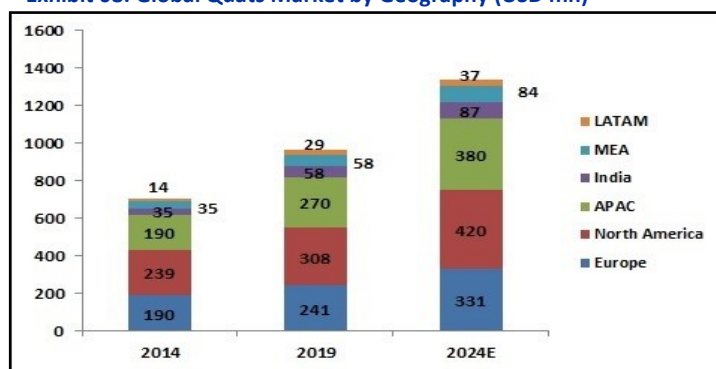
Quaternary Ammonium Salt: with a bromide counter ion is tetra butyl ammonium bromide which is widely used as a component transfer catalyst. Tetra butyl ammonium is low cost, environmentally friendly, operationally easy, and non-corrosive, hence used in the Pharma and agrochemical industry. The global market for quats (Quaternary Ammonium Compounds) is expected to grow at a CAGR of 6.8% from USD0.96bn in 2019 to USD1.40bn in 2024E. The growth in hospital-acquired infections (HAIs), an increase in the geriatric population, growth in the prevalence of chronic disease, and the rise in the number of surgical procedures are fostering the demand for the quats market. The market demand is driven by the increase in the prevalence of HAIs, introduction of strict regulations as well as favorable government policies on disinfection and sterilization. Fabric softeners, disinfectants, surfactants, antistatic agents, and wood preservation, are some more area of applications of quats. The demand for quats is seen growing in the Asia Pacific region owing to the increasing disposable income with increasing sales of personal care products. India is forecasted to grow with a CAGR of 7.1% during the forecast period.

Exhibit 07: Global Quats Market (USD mn)



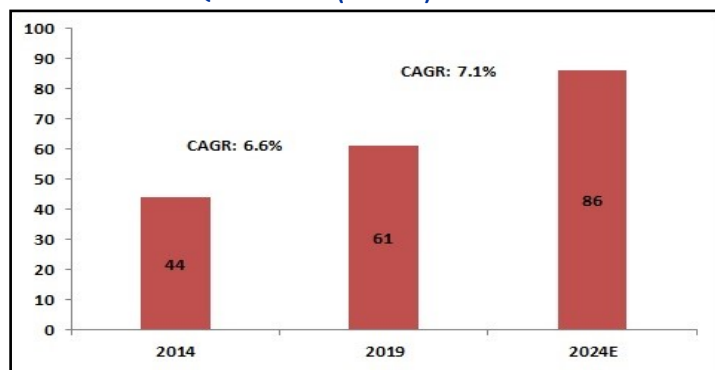
Source: Frost & Sullivan, RHP TCPCL, Progressive Research

Exhibit 08: Global Quats Market by Geography (USD mn)



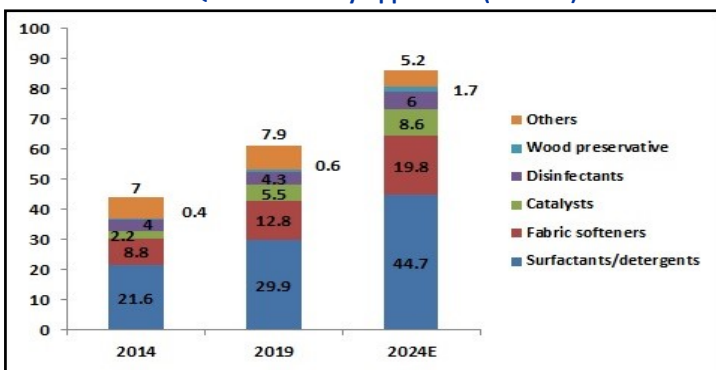
Source: Frost & Sullivan, RHP TCPCL, Progressive Research

Exhibit 09: India Quats Market (USD mn)



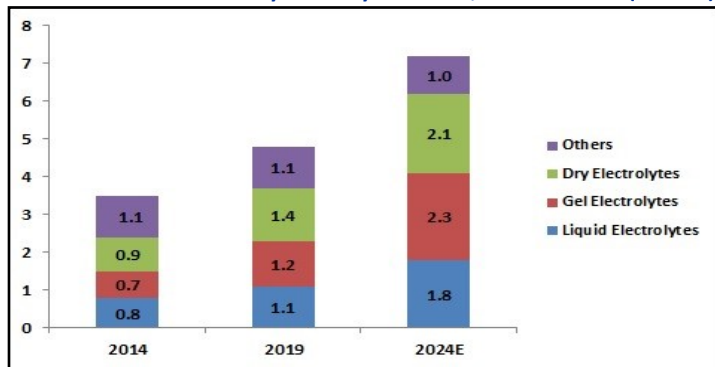
Source: Frost & Sullivan, RHP TCPCL, Progressive Research

Exhibit 10: India Quats Market By Application (USD mn)



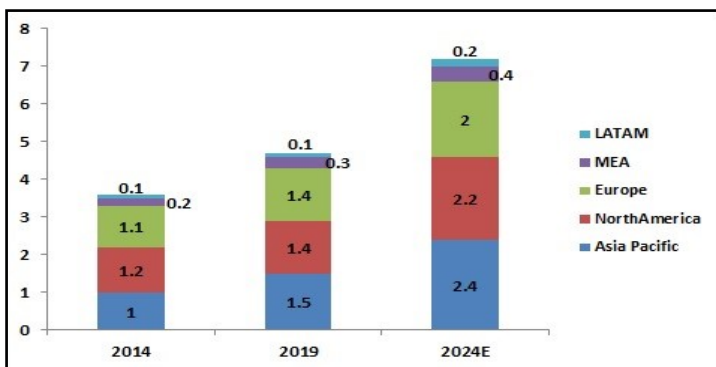
Source: Frost & Sullivan, RHP TCPCL, Progressive Research

Exhibit 11: Global Battery Electrolyte Market, Growth Trend (USD bn)



Source: Frost & Sullivan, RHP TCPCL, Progressive Research

Exhibit 12: Global Battery Electrolyte Market, By Geography (USD bn)



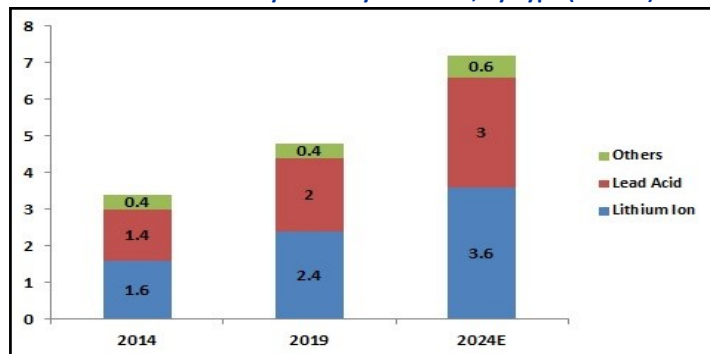
Source: Frost & Sullivan, RHP TCPCL, Progressive Research

About the Industry (contd.):

Global Battery Electrolyte Market: was valued at USD4.80bn in 2019 and is forecasted to reach USD7.1bn by 2024E with a growing CAGR of 8.2%. The applications of battery electrolytes are found in automotive sector (which is major growth driver) and electrical devices related to electrolytic cells. Liquid, gel and dry are the main forms of battery electrolytes, where gel electrolytes are gaining market acceptance. Super-capacitors or electrochemical capacitors which utilize high surface area electrode materials and thin electrolytic dielectrics to achieve capacitances several orders of magnitude larger than conventional capacitors. The global Super-Capacitors market was valued at USD1.4bn in 2019 and is anticipated to grow at a CAGR of 26% to reach USD4.4bn by 2024E.

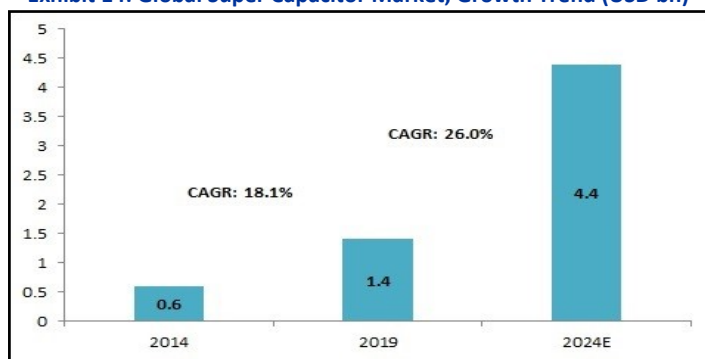
Increasing adoption of EV to reduce carbon footprint, rapid increase in automotive sales, high demand from replacement market of batteries, and increasing share of alternative energy sources in the energy mix are the key factors driving the growth of the battery electrolyte market. Increased production of lithium-ion battery for EVs is the main reason for the growth of this segment. The Electric Vehicles Initiative (EVI) is a multi-government policy to accelerate the adoption of electric vehicles worldwide. The current EVI members list includes Canada, China, Finland, France, Germany, India, Japan, Mexico, the Netherlands, Norway, Sweden, the UK, and the US. These countries have set an ambitious target to change 30% of its total vehicles fleet to EVs. Investments are being done in the lithium-ion battery electrolytes market.

Exhibit 13: Global Battery Electrolyte Market, By Type (USD bn)



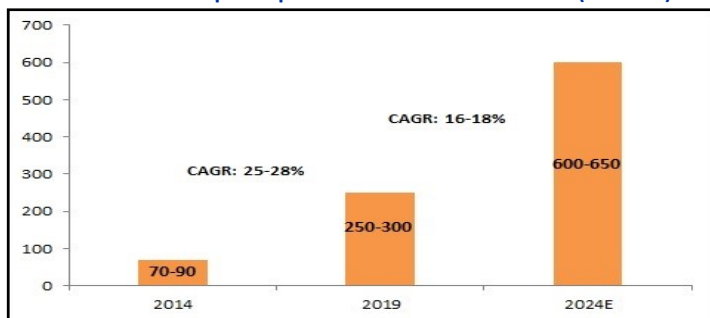
Source: Frost & Sullivan, RHP TCPCL, Progressive Research

Exhibit 14: Global Super Capacitor Market, Growth Trend (USD bn)



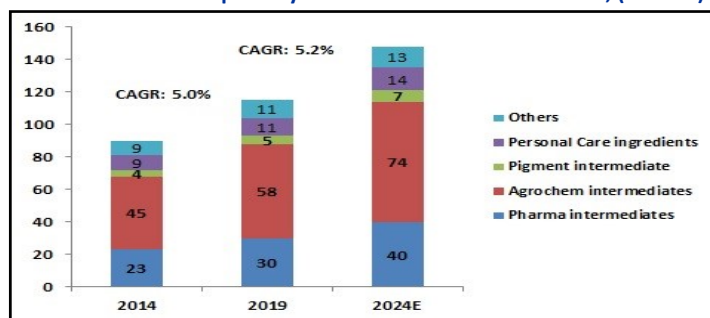
Source: Frost & Sullivan, RHP TCPCL, Progressive Research

Exhibit 15: India Super Capacitor Market Growth Trend (USD mn)



Source: Frost & Sullivan, RHP TCPCL, Progressive Research

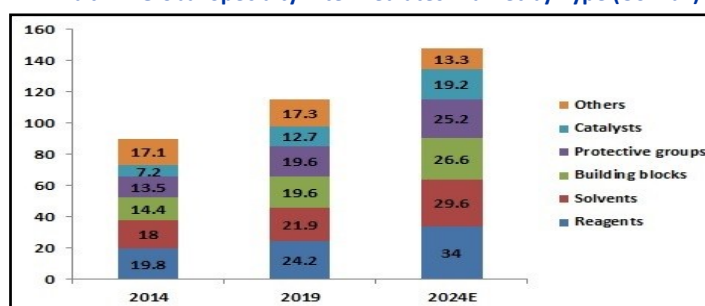
Exhibit 16: Global Specialty Intermediates Market Growth, (USD bn)



Source: Frost & Sullivan, RHP TCPCL, Progressive Research

Global Pharma, Agro and Other Specialty Intermediates: The global specialty intermediates market stood at USD115bn in the year 2019, and is projected to grow at 5.2% CAGR by 2024E and estimated to reach USD148bn. This growth is primarily driven through the high growth end-use segments such as pharmaceuticals, agrochemicals, paints and coatings, personal care, flavour & fragrances, etc.

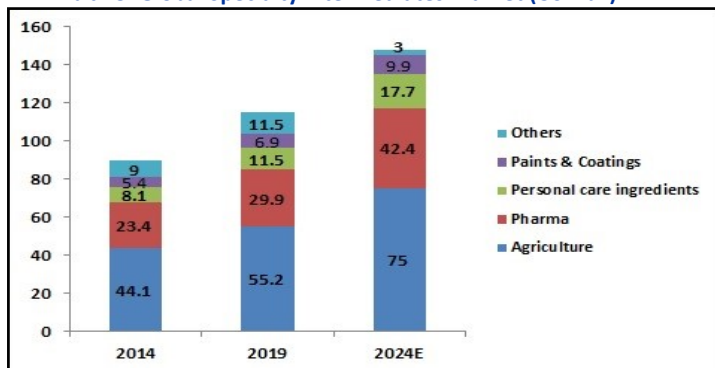
Exhibit 17: Global Specialty Intermediates Market by Type (USD bn)



Source: Frost & Sullivan, RHP TCPCL, Progressive Research

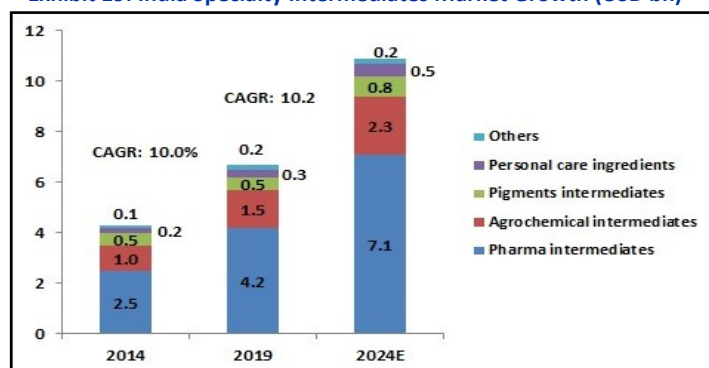
About the Industry (contd.):

Exhibit 18: Global Specialty Intermediates Market (USD bn)



Source: Frost & Sullivan, RHP TCPL, Progressive Research

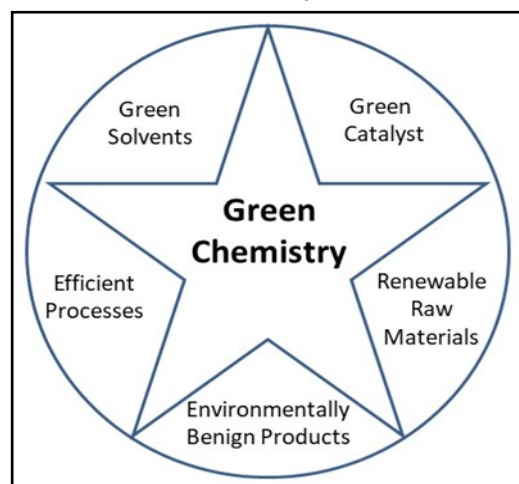
Exhibit 19: India Specialty Intermediates Market Growth (USD bn)



Source: Frost & Sullivan, RHP TCPL, Progressive Research

By now, it is known, that the evolution of green chemistry industry is a critical factor which is fuelling the growth of the green chemicals market. The same concept is also seen in a number of Indian companies, where the emphasis on use of green chemicals is evolving. The demand for green chemicals is seen on a higher range from the textile industry which is also one of the major end users of chemicals. Emission of harmful chemical effluents into water bodies is leading to rise of environmental concern and that of sustainability. A large number of chemical companies and their processes damage the environment while releasing dangerous effluent into the atmosphere, which has increased the scrutiny led by governments; this gives more importance to the role of green chemistry in sustainability. In the current scenario, most of the large chemical companies are conscious of their responsibilities towards environment and have included sustainability as part of their manufacturing processes. While at the same time, smaller companies are in need of guidance to implement such strategies. Governments across the globe have realised the need to provide incentives for research on chemical reactions that require less energy, manufacturing processes that generate less waste, and products that are less harmful to the environment. This will essentially require a collaborative effort by the industry, the academia, and the governments to promote the adoption of the green chemistry technologies.

Exhibit 20: Green Chemistry



Source: collegedunia.com/exams/green-chemistry-an-alternative-tool-principles-examples-chemistry-articleid-745, Progressive Research

The main aim is to reduce the amount of waste created instead of focusing on how to handle waste (that has already been created). Thus, green chemistry helps with source reduction, when the products are designed or manufactured or packaged to limit the amount or toxicity of waste created. This can be done with the help of catalysts instead of stoichiometric reagents. Catalysts are preferred because even though they are used in small amounts (can be used more than once) and stoichiometric reagents are used in large amounts and can only be used once. Thus the use of proper catalyst can help in reducing the overall amount of waste produced. Green chemistry plays a vital role in our daily lives and has in consumer products, pharmaceuticals, electronics and electrical industry and other industries.

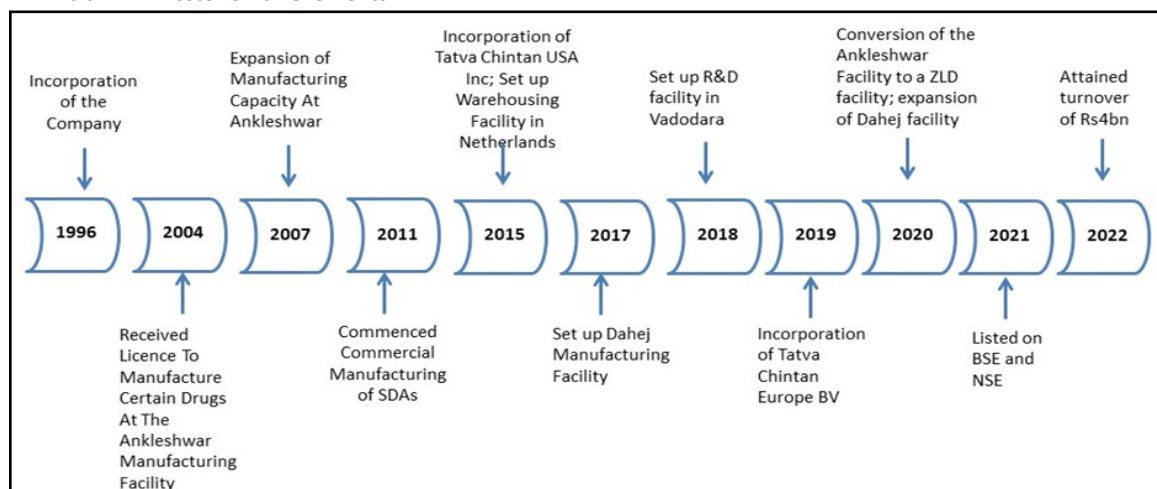
As the name suggest, green chemistry is the use of a set of principles in the design, production, and use of chemical products to assist decrease or eliminate the use or creation of hazardous chemicals. It is also known as **sustainable chemistry**. Green chemistry is

- the design of the chemical products as well as the processes which reduce or eliminate the use of hazardous substances
- applied across the life cycle of a chemical product including its design, manufacture, use, and disposal,
- it prevents pollution at the molecular level,
- it applies innovative scientific solutions to deal with environmental problems,
- it reduces the negative impact of chemical products on human health and environment

About the Company:

Tatva Chintan Pharma Chem Limited (TCPCL) is a specialty chemical manufacturing company involved in the production of varied structure directing agents (SDAs), phase transfer catalysts (PTCs), electrolyte salts (for super capacitor batteries) and pharmaceutical and agrochemical intermediates and other specialty chemicals (PASC). Incorporated in June 1996, the company operates through two manufacturing facilities located at Ankleshwar and Dahej (in Gujarat), which are strategically located very close to the Hazira port. The company has a dedicated R&D facility with a state-of-the-art research and development infrastructure recognized by the Department of Scientific and Industrial Research (DSIR), at Vadodara (Gujarat). Over the years, the company has been investing in the processes, manufacturing infrastructure and systems while growing from installed reactor capacity growing from 160KL to 280KL and the assembly lines being increased from 10 to current 29 assembly lines through FY19 to FY22. The manufacturing facilities have an annual installed reactor capacity of 280KL and 29 assembly lines, as on April 2022. Currently, the company is **the largest** and the only commercial manufacturer of SDAs for zeolites in India and **second largest** manufacturer on a global level. The company is also one of the leading global producers of an entire range of PTCs in India as well on a global level. The products manufactured by the company have wide applications across various industries like automotive, petroleum, pharmaceutical, agrochemicals, paints and coatings, dyes and pigments, personal care, flavour and fragrances etc. The top two end-industries which contribute significantly to the overall revenues earned by the company are automotive (significant portion of SDA revenues) and pharmaceutical (large part of PTC revenues). TCPCL exports to over 25 countries, including the USA, China, Germany, Japan, South Africa, and the UK and over the last 3-4 years, the company has fetched ~69-76% of the revenue from exports. The company has 2 subsidiary companies i.e. Tatva Chintan USA, Inc. (incorporated in March, 2015) and Tatva Chintan Europe B.V. (incorporated in March, 2019) and both the subsidiaries have no accumulated profits or losses. The company is promoted by Chintan Shah, Ajay Patel and Shekhar Somani, who have over 24 years in the specialty chemicals manufacturing industry.

Exhibit 21: Milestone Achievements



Source: TCPCL AR2021, Progressive Research

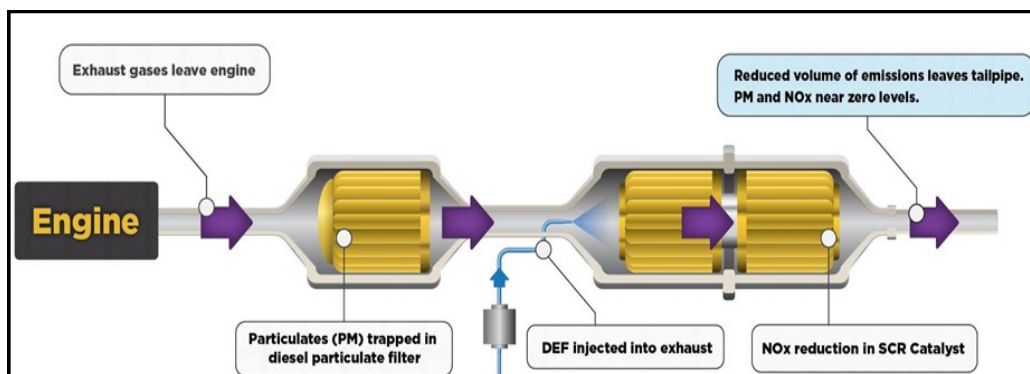
TCPCL continuously strives to improve the processes as well as the infrastructure required to help reduce the impact on the environment via various **green chemistry processes** (such as electrolysis). The company has adopted various green chemistry processes, including electrolysis as part of the manufacturing process which only uses water and electricity to produce the target product (besides the single starting raw material). Since no additional chemicals are used, this helps ensure no generation of any additional waste or by-products, thus making the processes eco-friendly and environmentally sustainable. The key focus of the company is to comply with the customers' manufacturing and industrial processes while manufacturing specialty chemicals for e.g. the SDAs and PTC products have various applications in green chemistry. The company had started with PTC and later forward integrated to SDAs which has given the company a strong understanding of zeolites, and the company is expanding into a new product range under intermediates using the **catalyst route** (entered into electrolyte salt manufacturing). The manufacturing facilities has various modern machinery and equipments, including reactors, assembly lines, ANFDs, centrifuges and RCVDs which enable undertaking various chemical processes like quaternization, methylation, amination, phase transfer reactions, cyclization, halogenation, condensation, and electrolysis. The customers catered to by the company include Merck, Bayer AG, Asian Paints Ltd, IpoX Chemicals KFT, Laurus Labs Ltd, Tosoh Asia Pte. Ltd, SRF Limited, Navin Fluorine International Ltd, Oriental Aromatics Ltd, Atul Ltd, Otsuka Chemical Pvt Ltd, Meghmani Organics Ltd, Divi's Laboratories Ltd, Hawks Chemical Company Ltd, Firmenich Aromatics Prod.(I) Pvt. Ltd, Jiangsu Guotai Super Power New Materials Co., Ltd. and Jade Chem Co. Ltd.

Investment Rationale:

(A) Solid Product Profiles: TCPCL is engaged in the manufacturing of a diverse portfolio of SDAs, PTCs, electrolyte salts and PASC. SDA and PTC products have various applications in green chemistry, which is related to the growing focus on green and sustainable technologies. TCPCL continuously strives to improve the processes and infrastructure to help reduce the impact on the environment via various green chemistry processes. The company serves customers across various industries, including the automotive, petroleum, pharmaceutical, agro chemicals, paints and coatings, dyes and pigments, personal care and flavor and fragrances etc.

(i) **Structure Directing Agents (SDA):** are quaternary salts which help in the formation of particular channels or pores during the synthesis of **zeolites** which have applications as catalysts. Quaternary ammonium compounds (which include the SDAs) are widely used in the manufacturing of zeolites. For the synthesis of zeolites, inorganic ions are required to structure the framework of atoms along with an additive and a solvent without which the specific structure of the zeolite cannot be obtained; this additive is

Exhibit 22: SCR Diesel Emissions Process

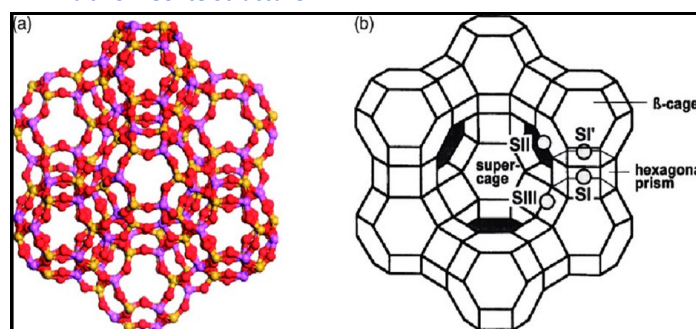


Source: dieselforum.org/about-clean-diesel/what-is-scr

known as **structure directing agents (SDAs)** or is also known as a **template**. Now, to obtain a specific structure, a very specific SDA is essential as these templates have precise structure directing capability. Thus, the role of a SDA is very complicated with a very complex manufacturing process to get the proper molecular arrangement in the template, with very high purity level. Many of these industrially important zeolites are produced synthetically. Zeolites are crucial in many catalytic processes like fluid catalytic cracking, hydrocracking, dewaxing, production of octane boosters, hydrodesulphurization, Fischer-Tropsch synthesis, methanol-to-olefin reaction, aromatic alkylation, nitration, halogenation, nucleophilic substitution and addition reactions and many more reactions. Some of the key manufactures of SDAs include SACHEM Inc., Tatva Chintan, Merck KGaA, Otto Chemie, Alfa Aesar, TCI Chemicals etc. The largest manufacture of SDA is SACHEM Inc., a US-based chemical company with a commanding market share (emission control), followed by TCPCL which has the second largest market share.

Recently, zeolites have also been introduced for catalytic emission control, e.g., reducing the **emission levels of nitrogen oxides (NOx)** from both stationary as well as mobile sources. Zeolites with transition metals such as copper and iron have been proven to be active for the selective catalytic reduction reaction, which is considered as one of the preferred technologies for emission control in automotive applications. Selective catalytic reduction of NOx by ammonia is the preferred technologies for NOx removal from lean exhaust gases in automotive applications. In addition to the applications mentioned above quaternary ammonium compounds (which include the SDAs) are used as agents used as **bioactive**. These may consist of a large range of antimicrobial activity (over a broad range of pH) and are used as pesticides, wood preservatives, sanitizers/disinfectants, fungicides, and hard-surface cleaners, medical, domestic, and agricultural applications. In many cases, these are considered effective against fungi, bacteria, and viruses at very low temperatures also. With the focus on green technology, industries are evaluating new technologies, investing in R&D for new and innovative application which is driving the growth of the zeolite market and in turn driving the quaternary ammonium compounds market. TCPCL is the largest and only commercial manufacturer of SDAs for zeolites in India and second largest on a global level. SDAs market is growing at a CAGR of ~23-25% and in years to come, this growth is likely to sustain due to rising regulations. **Euro-6** norms were introduced in 2015, which aimed at reducing pollutants like nitrogen oxide (NOx), carbon monoxide (CO), hydrocarbons (THC and NMHC) and particulate matter (PM). Reducing these pollutants also aims at improving fuel economy and lowering the CO2 emissions. **Now, Euro-7** norms are expected to be introduced in 2025, which may be the final emission standard before the sale of new combustion powered cars is phased out completely.

Exhibit 23: Zeolite Structure

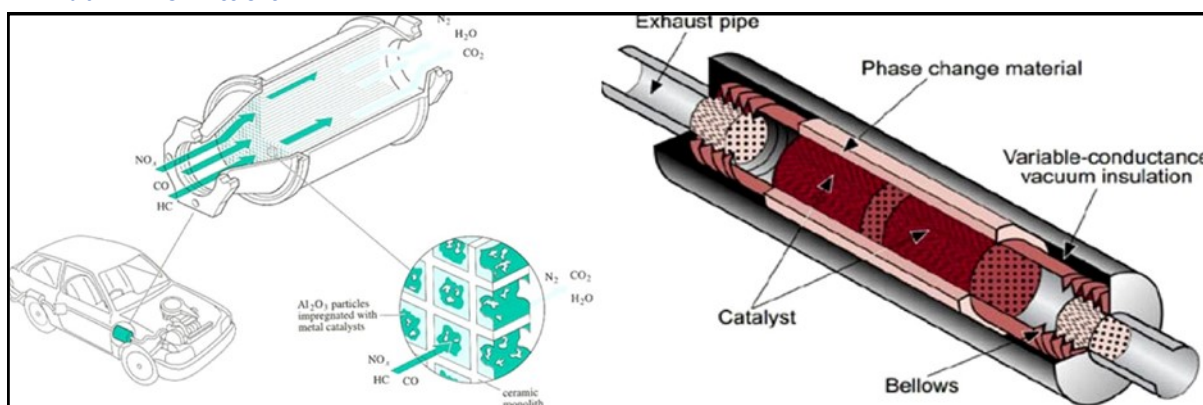


Source: researchgate.net/figure/Structure-diagram-of-zeolite-13X_fig4_324922044

Investment Rationale (contd.)

SDA revenues for TCPCL are anticipated to benefit from adoption of more stringent emission norms and higher volumes of SDAs with growing requirement of reducing NOx emission. In times to come, the introduction of Euro-7 standard is anticipated to be a strong trigger for growth of the company (the company has missed opportunities for Euro-6 in the developed markets). The company can see increased volume sales in Europe and US with increase in the addressable market. The company is already in talks with 2 large customers and its commercial business with one of these customers has been negotiated with anticipated supplies to begin from Q2FY23 and begin to supply to the other customer from January 2023. No one makes zeolites in India, as a result of which no company makes SDA; therefore the entire produce of TCPCL is **100% exports**. In the current scenario, the demand for SDA has not gone anywhere, the forecast of the customers continues to remain the same; TCPCL continues to work on its capex plans and is maintaining a strong inventory, because the Management wants to be ready when the demand begins to start and not miss the opportunity to cater to its premium customer base. Any changes in the plant, or location or raw materials can lead to alterations in the quality of the final product manufactured by TCPCL or any other player in the industry, can lead to changes in the final applications of the end user product (making the business very sensitive); and the new manufactured products will require re-qualification where, the biggest concern is to get approvals. These are **futuristic businesses**, and will take time to grow.

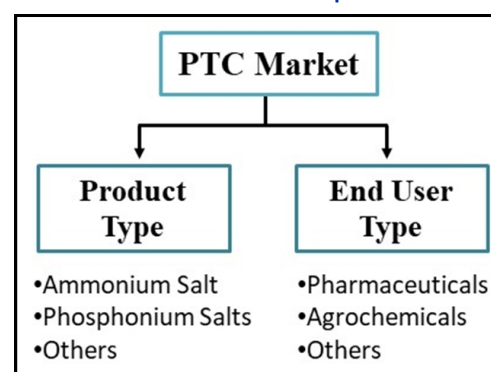
Exhibit 24: PTC Emissions



Source: ars.els-cdn.com/content/image/1-s2.0-S2666916120300062-gr3_lrg

(ii) Phase Transfer Catalysts (PTC): are used to facilitate the migration of a reactant from one phase into another phase where reactions occur in a heterogeneous multi-phase system. PTC is a special form of heterogeneous catalysis. The ionic reactants are often soluble in an aqueous phase but insoluble in an organic phase, thus the need of **phase transfer catalyst** arises. These are basically type of catalysts that allows a reactant to be migrated from one phase to another and also help eliminate the need of costly or unsafe solvents. The catalyst functions as a detergent for solubilizing the salts into the organic phase. In the conventional reactions, the solvents dissolve all reactants in one phase and make use of costly raw materials. PTC leads to the acceleration of a reaction upon the addition to produce desired product. PTC is widely used in what is known as green chemistry where the foundation of the chemistry is to reduce residual waste and use an organic solvent which ultimately boosts the market for catalysts for phase transfer. These also enable the use of low-cost inorganic bases and other reagents thus providing the ability to use simpler process equipment. PTCs have a variety of industrial processes while offering faster reactions, higher conversions, higher yields, produces lesser by-products, eliminates the need for expensive or dangerous solvents, eliminates the need for expensive raw materials and thus minimize the problems related to waste generation and its disposal. PTC's are used in the pharmaceuticals industry (synthesis), R&D, drug formulation, laboratory applications etc. TCPCL has been focusing on the concept of green chemistry, which is also the major building block of the company and, thus has been a pioneer in providing such solutions to the industry player. TCPCL is one of the leading global producers of an entire range of PTCs in India and one of the key producers on a global level. The key players include SACHEM Inc (US), Tokyo Chemical Industry, Nippon Chemical Industrial (Japan), Volant-Chem Corp (China), Evonik Industries, Sigma Aldrich (Germany), Solvay (Belgium), Tatva Chintan, Dishman Group, Central Drug House, Pacific Organics, Otto Chemie etc.

Exhibit 25: PTC Market Breakup

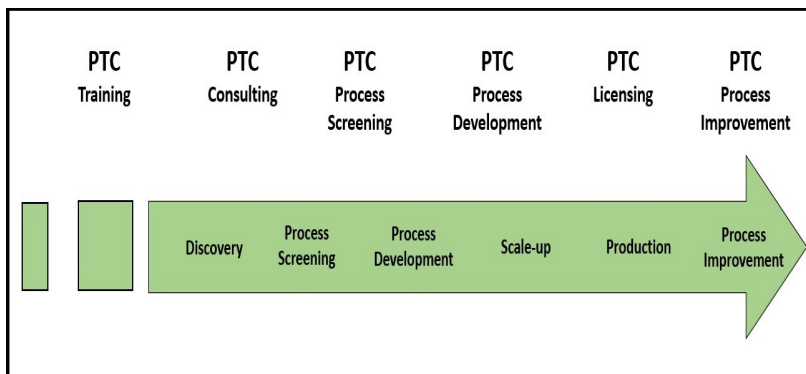


Source: manufacturelink.com.au/phase-transfer-catalyst, Progressive Research

Investment Rationale (contd.)

The uses of PTC has been constantly evolving from being an agent merely used during chemical transformation to a more useful catalyst with development of new applications, methods, concepts, theoretical development and worldwide recognition. For this segment, the company has the capability to manufacture customer made or tailor **made products**. TCPCL is looking for long term loyalties from its customers and has been successful in maintaining good long term relations. On a global level players from Japan, US, Korean don't change the source, hence have good long **term relations**, if acquired and many of these are in the customers list of TCPCL. Larger business comes via new applications for TCPCL, since at some stage the business related to catalysts will stagnant with stable margins, hence the need to produce new catalyst or products arises. In India, many players follow TCPCL, in terms of what TCPCL has worked on and what they intend to manufacture going forward. Gradually the industry players have started moving towards using PTC, and this has led to drastic operational improvements while using PTC by the customers. In such a situation, the performance of the catalysts become very important and the use of correct catalyst also become imperative. In general reactions, the amount of catalyst used, may be lesser than 1% of the total reactants used, and the performance can alter the entire reaction and purity of products.

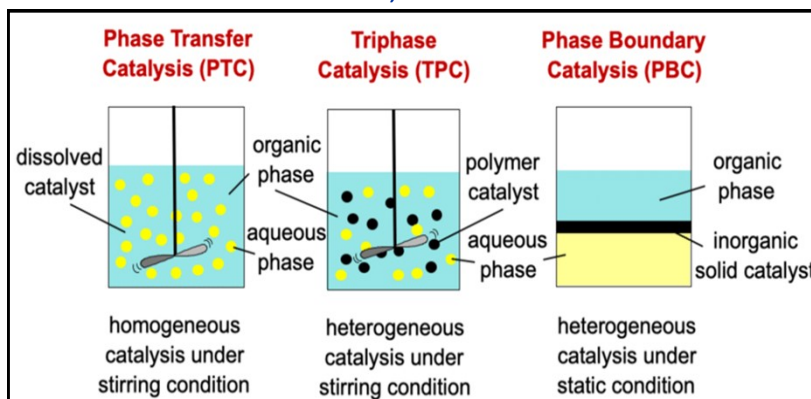
Exhibit 26: PTC Processes



Source: Phasetransfer.com, Progressive Research

PTCs have applications in green chemistry where there is increasing global focus on reducing residual waste and use of organic solvents. Modern agricultural techniques and the use of herbicides allow PTC applications in agro business with herbicide production in an efficient manner with improved purity. PTCs have applications in simple organic reactions in Pharma, agricultural chemicals, perfumes, flavourants, dyes etc., as well as for specialty polymerisation reactions, polymer modifications and monomer synthesis. The imposition of **strict regulations** in western countries (use of harmful compounds in pharmaceuticals) is leading to the increased consumption of PTCs. PTC contributes ~23% of the total revenues for TCPCL. The future of this product is considered to be very bright as it can be used as a tool to handle future chemical problems in an energy efficient way.

Exhibit 27: Differences Between PTC, TPC and PBC

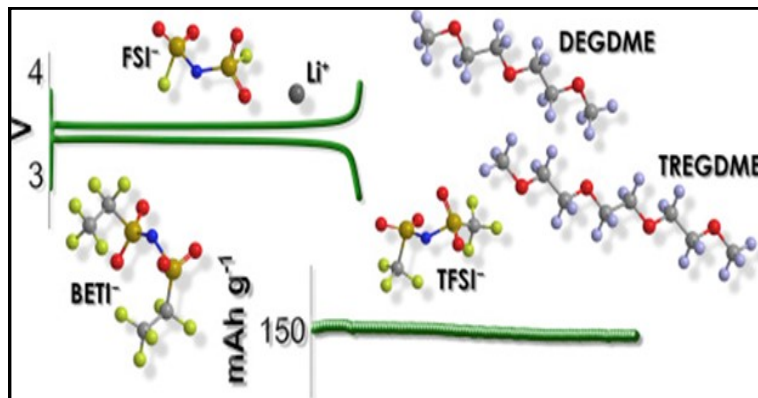


Source: researchgate.net/figure/The-differences-between-phase-transfer-catalysis-PTC-triphas-catalysis-TPC

(iii) Electrolyte Salts: are used in the manufacture of **super capacitor** batteries, which are used in automobile batteries and other batteries. Super-capacitors or ultra-capacitors are basically charge storage devices that store electrical charges via electrochemical and electrostatic processes. These have the beneficial properties of fast charging, low-temperature performance, long service and long cycle life. In distant future, super-capacitors have the potential to replace or complement traditional batteries. These have high energy density as compared to the common capacitors. They have a higher power throughput i.e. it can charge and discharge energy in a **fraction of a second**. They are best suited for very small bursts of energy or power; super capacitors are better than traditional capacitors due to their ability to store and release energy. Super capacitors have the capability to top the energy-charge off in just 15 seconds and can be fully charged in a few minutes. In the recent past, Peugeot-Citroen, Toyota, Mazda and Lamborghini have released models that use a combination of super-capacitors and conventional lithium-ion batteries. The applications of battery electrolytes are found in electrical devices, end use industry in automotive, transportation industry for aerospace, locomotive, and marine. There are many research experiments in the automotive industry where scientist are trying to focus on the use of environment friendly products and thus, the increase of bio-based chemicals is anticipated to be seen on a larger scale in this industry. The consumer electronics segment too, is anticipated to clock immense growth in the battery electrolytes market on a global level. TCPCL is the largest producer of electrolyte salts or organic battery electrolytes for super capacitor batteries in India. Growth in this category will help drive higher sales from this segment in the future, despite having a small contribution currently; its future growth potential is huge. For TCPCL, the business related to **glyme** (monoglyme) is gradually scaling up and the company now is looking for the exports as a potential business.

Investment Rationale (contd.)

Exhibit 28: Glyme Based Electrolyte (Lithium LiTFSI) reaction



Source: sciencedirect.com/science/article/abs/pii/S0013468619304542

Exhibit 29: Super-Capacitor V/s Lithium-Ion Battery

Batteries	Capacitors
Power density	High Load Current
Storage Capability	Low Specific Energy
Limited Life cycle	Long life cycle
Long Charging Time	Short Charging Time
More Temperature Sensitive	Good Temperature Performance
Voltage and Current limitation	Linear Discharge voltage
Constant Voltage	High Self Discharge
Average Cost Per Watt	High Cost Per Watt

Source: futurebridge.com/industry/perspectives-mobility/supercapacitors, Progressive Research

(iv) PASC: The products manufactured by the company under this category i.e. Pharmaceutical and Agrochemical intermediates and other Specialty Chemicals (PASC) are used in various Pharma and agrochemical products as intermediates, disinfectants, catalysts and solvents. Intermediates could be substances (solid, liquid or gas) that are semi-finished products and can be used as catalysts. In such reactions, the chemical intermediates are generated at every step which enables changes to convert the reactant into a final product. Depending upon the reactions and end users application, a number of reagents, solvents, building blocks, protective groups, lubricants, etc. are used. *Reagents are more or less reactants; solvents help facilitate the reaction; building blocks are the key materials which are responsible for the formation or imparting specific property to the final product; protective groups protect the organic substances from breaking down or disintegrating.* All these sub groups account for ~75% of the market of specialty intermediates across the globe. As many of these reactions are complex in nature, the key is to try and reduce the temperature, reaction time, reduce wastes or by-products generated and thus help increasing the operational efficiencies of the chemicals companies or players involved. TCPCL also manufactures specialty chemicals that have applications in dyes and pigments, personal care ingredients, flavour and fragrance sectors etc. Specialty intermediates are consumed on a very large scale in segments related to manufacturing, API, crop protection active ingredients, paints and coatings, detergents, textiles, etc. The China+1 strategy have led to uptick in the various categories of CDMO for intermediate products for agrochems and Pharma. The key products in the category of PASC include low-moisture and high-purity glyme (used as solvent for electrolytes of lithium-ion batteries); agrochemical intermediates, Pharma intermediates, disinfectants, antiseptics (personal care) including cetyl group; epoxy and resins. Glyme is generally used to dissolve lithium-based electrolyte salts for formulation of the electrolyte solution which is used in the batteries by OEMs; and as an extension to this, the industry as well as TCPCL is in the process of developing intermediates using continuous flow chemistry.

(B) Strong Foundation: Since its inception and over the years, TCPCL has been building a strong foundation and has been successful in fortifying the same with the help of good manufacturing facility, better raw material procurement policies, strong R&D activities, adhering to the quality, with IT improvements and trying to the leader in terms of competition in India.

The company has **two manufacturing facilities** situated at Ankleshwar and Dahej; as per the Management commentary, there is not much scope for expansion at the plant at Ankleshwar, however, there are opportunities for expansion at the plant located in Dahej. The manufacturing facilities are ISO 9001:2015 certified for quality management systems.

The **raw materials** used by the company for manufacturing process are categorised as tertiary amines, alkyl halides, general solvents and general fine chemicals. The cost of raw materials consumed ranges from 50-57% (over the last 4 years). Apart from tertiary amines (domestic as well as overseas suppliers located at USA, Germany and China), the remaining raw materials are sourced from domestic suppliers in Gujarat and Maharashtra, on a purchase order basis.

Over the years, TCPCL has been making regular investments in **R&D** to expand the product offerings and to streamline the manufacturing processes. In addition to this, as a specialty chemicals manufacturer, **technical innovation** in formulations and applications of the products is an important parameter for the growth of the company. The Management continuously **monitors industry trends** in order to ensure that the products continue to remain relevant and meet the evolving market demands.

Adherence to **quality standards** is a critical factor; any defects in any of the products manufactured by the company or failure to comply with any specifications required by the customers may lead to rejection of the entire batch of the products. Thus, TCPCL has modern quality control lab equipped with latest instruments, including GCMS, GCHS, GC, HPLC, ICP-OES, IC and XRD. In order to maintain the quality standards and comply with the design specifications, the quality control is maintained from pre-manufacturing to all the stages of the manufacturing process including raw materials, packing material and in-process products.

Investment Rationale (contd.)

The company has implemented various **information technology** (IT) solutions which are used for customer order management & dispatches, production planning & reporting, manufacturing processes, financial accounting and scheduling raw material purchase. TCPCL intends to continue its focus on **investing in IT systems** and processes to improve operational efficiency, customer service, decision making process, reduce manual intervention and improving reliability and efficiency of the operations.

TCPCL operates in an environment with **competition** from smaller regional and existing competitors located both in India and large multinational companies globally (particularly from USA and China). The competition depends on the market, type of products and also on the ability to fulfill the contractual obligations (timely delivery of products, price and quality). Some of the competitors include Aarti Industries, PI Industries, Fine Organic Industries, Delta Finchem, Dishman group and Pacific Organics Private Limited.

(C) Upcoming Triggers: The strength of the company and its operations can be easily judged by the parameters related to expansion, R&D capabilities, increasing wallet share with high barriers to entry

Existing Product Portfolio Expansion: The company has been consistently trying to diversify the products portfolio to cater to customers across various segments, sectors, and geographies. In pursuit to strengthen the existing product portfolio, the company is also further looking at prospects for increased growth and profitability while tapping segments with attractive growth prospects. For e.g. the company is looking at increasing the focus on products manufactured using **continuous flow chemistry** processes as well as electrolysis processes. In addition to this, the company is also concentrating on initiatives related to environment conservation for e.g., the demand for automotive emission control mechanisms which is poised to grow. TCPCL continues to lay emphasis on the quality of products manufactured with timely delivery of the same which is a key factor to attract new customers (and retaining the existing ones).

Develop R&D Capabilities: The R&D teams intend to identify and adopt new-age technologies for the process & product development, improve the productivity, quality and cost effectiveness while making the products eco-friendly. In addition to this, the team is also aiming at developing technologies to produce conventional products but by using **new-age technologies** such as continuous flow chemistry and electrolysis processes.

Increase Wallet Share: The customer base of TCPCL has marquee companies with longstanding relationships (repeat and increased orders received) while becoming a **preferred supplier** to these customers. The company is involved in organizing awareness seminars, providing support at early stages of product development to the customer (potential opportunity to commercialization). The continuous R&D endeavors, reputation for quality products with timely delivery can help the company increase its wallet share and product portfolio with existing customers as well as new customers. The company is looking at expanding its geographic stretch as many players are looking at alternate suppliers via the China+1 offshore strategy.

Capitalizing Growth: TCPCL has been capitalizing on growth opportunities in the specialty chemicals industry due to its well positioned operations led by an experienced management team. The company is following a beautiful strategy of adding **capacity in a phased manner** to ensure that the available capacities are utilized at optimal levels and then go for another round of capex. Currently the company is looking at expanding the operations at its manufacturing facility in Dahej and utilize ~7.8 acres of the available land. This expansion plan will enable the company to meet the anticipated increase in the demand for the products in future, more efficiently and drive profitability.

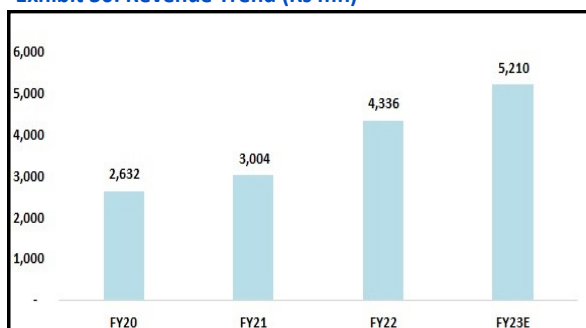
New Launches: In Q4YF22, TCPCL has introduced a new product category of **flame retardants** and are in the process of starting the commercial trial production in Q1FY23 or so. This product category of flame retardant has a huge market potential and the company continues to follow its strategy of targeting very niche segments in the specialised electronics. As per the Management commentary, this product category alone has the **potential** to scale up to the total revenue earned by TCPCL going forward. The existing plant in the upcoming expansion is anticipated to be used for manufacturing flame retardants.

High Barriers to Entry: The space of specialty chemicals industry involves the applications of complex chemistries for manufacturing products, complex production processes and very high levels of technical knowledge and R&D capabilities, which naturally translated into high barriers to entry for the new entrants. Knowing that the nature of the application of the products and the processes involved are quite complex, these are subject to very sensitive and rigorous product approval systems where the parameter of impurity specifications is very stringent. These processes have very **lengthy qualification requirement** or tenure since these products are used by players in industries related to automotive, petrochemical refineries, pharmaceutical etc. These industries themselves have specific entry barriers which explains the number of years spent for approval of the products and or processes. Now, if one looks at the companies' related to specialty chemicals, strong entry barriers are seen in terms of vendor acquisition, registration process, lengthy product approval procedures as well as stickiness and customer loyalty to ensure sustainable growth. Companies which have high level of technical skill, expertise for developing in-house innovative processes, ability to understand and undertake complex chemistries (related to raw materials and intermediates) and significant amount of training can only accommodate to such demands while accomplishing the entry barriers. In pursuit of the same, a resilient and niche business model is a unique driver for these companies and TCPCL has been capable of providing the same to its customers.

Risk and Concerns: The ability to manufacture existing and **new products** for sale in India and abroad is critical for the launch of new products and eventually boosts revenues. The availability and pricing of the raw materials can be dependent on the supply disruptions, price volatility, commodity market fluctuations, the quality of raw materials, currency fluctuations, consumer demand, changes in government policies etc. The company does not have any long term agreements with raw material suppliers, and thus forecasting the supply and demand is slightly difficult which can have an impact on the working capital. A significant proportion of the business is dependent on the outcome of the R&D team and innovations to add new products to the portfolio. Needless to mention, product development requires **significant time and cost investment** before it is commercialized. The demand for the products is directly dependent on the factors affecting the associated industries where the products are utilized including the automotive, petroleum, pharmaceutical, agro chemicals, paints and coatings, dyes and pigments, personal care, flavor and fragrances industries etc. Any **disruptions** faced by these companies can affect the manufacturing and supply chains for TCPCL also. The ability to manage and sustain customer relationships is critical for TCPCL; the company derives ~47-60% of the total revenue from its top ten customers. The demand for the products from the key customers determines the revenue and profitability; increased sales by the customers increases the revenue and vice versa. Thus, the **volume of goods** sold by the company can vary due to inventory management, market demand, supply pricing trends and customer preferences. TCPCL has a big portion of sales coming from the exports market. The company sources raw materials from India, US, China and Germany, the cost of the **imported raw materials** is also affected by fluctuations in the exchange rate of currencies. As the company export the products and import some of the raw materials it helps in naturally hedging the foreign currency exposure. TCPCL competes with few players in India and some players on global level, therefore, the ability to fulfill the contractual obligations, timely delivery of products, its pricing and quality become very critical for the company. Since the company competes with many MNC players, maintaining the quality of products manufactured is a very significant parameter. Some of these competitors have advantages in manufacturing certain types of precision products, wider product ranges, larger sales teams, ability to negotiate price, greater intellectual property resources and broader appeal across various divisions. As the company is looking at expanding the operations into new geographies, exposure to competition from newer players is inevitable. In this industry where TCPCL is active, the buyers **audit the facility** of manufacturers periodically to make sure maintenance of the required standards, regulation and SOP. Such audits are expected to be more stringent in coming years.

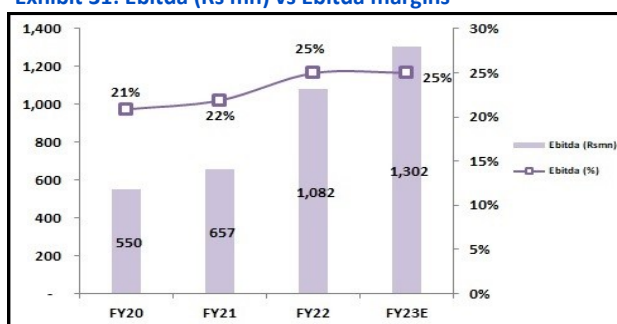
Financials: We estimate the revenues to grow at a CAGR of ~25-30% over FY21-FY24E driven by strong growth in the SDA segment. Going forward, strong revenue visibility is anticipated via strong industry growth, decent opportunities to gain market share (particularly in SDAs and PASCs segments) and new product launches. The company is also expanding capacities to suffice to the demand seen. There should be decent expansion across the margins as well led by the higher growth chalked for the SDAs which are high margin products. The company expects Q1 and Q2 of FY23, to see weaker demand in SDAs, though the underlying demand of SDAs continues to remain very strong. The demand revival is expected with improvement of semiconductor chip availability, and the company seems to be prepared as and when the demand from the customers starts showing an uptick. On the capex, the company is expected to commission greenfield plant in Dahej by Q3FY23 which will add 200ktpa of reactor capacity to the existing 280ktpa and 10 assembly lines on a base of 29 (the whole plant has total capacity to put up 48 lines of which 29+10 are currently under focus). It would include expanding reactor capacity and probably capex towards a dedicated facility for glyme, and other products using the catalyst method. The company is looking at adding additional land in Dahej for further growth in FY24-25E. The company has a healthy balance sheet with net cash on books. On the return ratios, the RoCE would have the impact of the capacity expansions but should gradually improve with increase utilizations.

Exhibit 30: Revenue Trend (Rs mn)



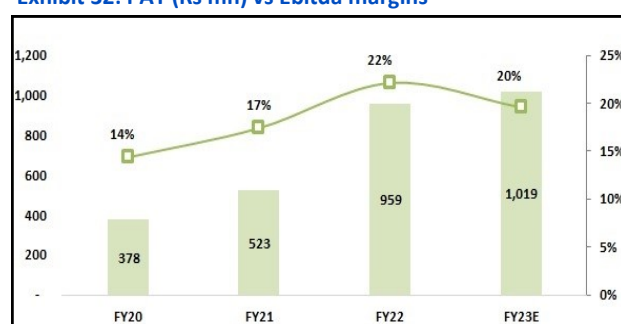
Source: TCPCL AR, Progressive Research

Exhibit 31: Ebitda (Rs mn) vs Ebitda margins



Source: TCPCL AR, Progressive Research

Exhibit 32: PAT (Rs mn) vs Ebitda margins



Source: TCPCL AR, Progressive Research

Outlook and Recommendation:

Standing true on its name, i.e. Tatva (which means minute element) Chintan (in deep thinking), the Management closely follows the same philosophy in its niche businesses that are minutely tracked. TCPCL is one of those companies which have a more or less **monopoly** in the business that they are involved in, commanding a high market share in certain products sold. Though these are at times beneficial to fetch consistently higher margins, these operations also invite the risks which are mentioned above. The company has the capability to produce some of the niche and partially **futuristic** type of products, which is backed by the immensely strong R&D team. One of these initiatives is the focus on **green chemicals** processes or green chemistry. Gauging the potential that the company holds in its business, the assumptions seem to be quite **conservative** and definitely would need upgrades as and when the market dynamics start supporting the company. TCPCL has been able to garner significant **market share** in the respective product categories, while striving, capturing and looking at exploring adjacent businesses in the niche segments. The company today, definitely has a very small base, but has a **robust business model** which can make it a potentially bigger entity via the capex spends which would help to capitalize on the future demand. The current promoter holding stands at **79.17%**, indicating towards some offloading going forward to meet the requisite/norms of 75% holding by SEBI. Some of the key factors which makes TCPCL a lucrative investment idea includes its presence in high-growth categories involving green chemistry (SDA, super capacitors, glyme, high end PTC), presence in segments or businesses where there are very few players on a global level, focusing on high margin manufacturing processes and new products, strong technical knowhow, constantly expanding its R&D capabilities, constantly reinvesting the cash flows, capex plans which provide good growth visibility and an overall impressive financial performance. The company appears to be a **hidden gem** which has all the capability to grow, expand and flourish and become larger in size in multiple niche areas. The company has a sound yet aggressive and well directed Management; one of the key essentials for futuristic ramp up. Considering the current valuations as well as various macro/micro factors to be digested; we feel that the company qualifies as an apt **SIPPING candidate** for a long term target of Rs2534.

Exhibit 33: Price v/s Nifty



Source: Ace Equity, Progressive Research

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