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THE ECONOMIC TIMES

POLYMERS

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Polymer Manufacturing
**The changing face
of the polymer pipes
market in India**

Industrial Lubrication
**Impact of lithium
price rise**



“Celebrate Women’s Achievements Raise Awareness Against Bias”

Bhavana Bindra, Managing Director, REHAU South Asia, talks about the company’s new venture into the modular kitchen segment and opportunities for India’s polymer industry



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THE ECONOMIC TIMES POLYMERS

Volume 23 Issue 1 April - May 2022



Spurring the Green Investment

The implementation of the Production Linked Incentive (PLI) scheme will lead to potential capital expenditure of Rs 2.5-3 lakh crore over the scheme period and will account for 13-15% of average annual investment spending in key industrial sectors over the next 3-4 years, a CRISIL analysis shows. Since its introduction, the PLI scheme drew investment of Rs 2.34 lakh crore in 15 sectors, enhanced production by Rs 28.15 lakh crore & created a whopping 6.45 million jobs in five years. However, now is time for the government to extend highly effective schemes to other grappling sectors of the Indian economy to pull them back on a growth trajectory. This could translate into an incremental revenue addition of Rs 30-35 lakh crore over the scheme period. The scheme will have many firsts in terms of bringing integration across supply chains, reducing import dependencies, and propelling exports.

PLI is now poised for rapid on-the-ground execution, with almost 60% of the capex approved already and major spending set to occur over fiscals 2023-2026. The approved capex is in 10 sectors. While capex in mobile, pharma and telecom has already kicked off, that in capital-intensive sectors such as automobile and solar photovoltaics — which form 70% of the committed investment — will kick off from April 2022.

The scheme has received interest from over 900 players across sectors, of which approximately 350 have got approval so far. Of the approvals, 20% have been received by global multinationals and the rest by domestic players. Also, 50% of the bidders are large in terms of revenue, while the rest are medium and small players.

PLI will spur green investments in India, with 55% of the scheme expected to be green, in sectors such as auto for electric vehicles/ fuel cell electric vehicles, solar photovoltaics, and advanced chemistry cell (ACC) batteries.

That said, PLI will aid exports, too. Of the 15 sectors, nine promise export potential, ranging from 20-to 80% of the incremental revenue generated. This, in turn, can create an annual export potential of Rs 2 lakh crore, or 6% of the total exports of calendar 2021. Sectors that could benefit from exports include mobiles, pharma, food processing, IT hardware, white goods and speciality steel.

Industry stakeholders will remain watchful for timely payment of incentives, medium-to-long-term policy push from the government, the extent of value addition emphasised in these sectors, and the ability of players to achieve these numbers for technology and capital-intensive sectors, such as battery and solar-module manufacturing, amid evolving global supply chain dynamics.

R Kamat
Editor



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STRAPPING LINE



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Danfoss Strengthens 'Make In India' Commitment With New Hydrostatic Production

Eaton Fluid Power, a member of Danfoss group, has launched an all-new production line for hydrostatics at its state-of-the-art facility in Pimpri, Pune, to cater to the demand of the local agriculture sector. Danfoss is the first organisation to have manufacturing capability of hydrostatics transmission solutions in India.

The inauguration was presided over by Eric Alstrom, President of Danfoss Power Solutions, Astrid Mozes, President Hydrostatics Division & rest of Danfoss Power Solutions Leadership Team from headquarters, India leadership team and select Pimpri campus employees, following due covid protocols.

The recent global acquisition of Eaton's hydraulics business has strengthened Danfoss Power Solutions offerings.



The addition of this new hydrostatics line will help improve the energy efficiency and sustainability quotient of applications where these solutions are deployed. The fast return on investment & operational efficiency offered by the product also makes it well suited for the Indian market. This new state-of-the-art assembly line and test stand is MES

integrated, very high on safety and in-process Poka-yokec, keeping in mind the strong safety culture and zero-defect mindset. The digitalization capabilities, size and accessibility benefits of the product are also its highlight.

Danfoss's Pune facilities address the rising demand for innovation and development in India's digitalisation, urbanisation, agriculture & electrification journey.

The location also places the manufacturing facility in close proximity with its key customers across various sectors and also the Danfoss India Innovation Centre located at Magarpatta, Pune. The access and availability of land, infrastructure and skilled labor in the area have also been a key consideration for the company to strengthen its base in the city.

Exxonmobil Makes First Commercial Sale Of Certified Circular Polymers

ExxonMobil has completed its first commercial sale of certified circular polymers, using its Exxtend™ technology for advanced recycling of plastic waste. The purchaser is Berry Global, a leading provider of innovative packaging and engineered products, which will use the circular polymers to manufacture containers for high-performance food-grade packaging on a mass balance approach.

"We are scaling up our advanced recycling capabilities worldwide to manufacture more circular products for our customers," said Karen McKee, president of ExxonMobil Chemical Company. "Our Exxtend technology helps us meet the growing demand for certified circular polymers, particularly in food contact applications where plastic products provide key sustainability benefits."

Exxtend™ technology helps expand the range of plastic materials that society recycles while main-

taining the performance of products over multiple recycling loops. The product quality and performance of the certified circular polymers are identical to polymers produced from virgin raw materials, increasing the variety and number of customer applications.

"We have ambitious sustainable packaging goals that include achieving 30 per cent circular content across our fast-moving consumer goods packaging by 2030," said Tarun Manroa, chief strategy officer of Berry Global.

The initial sale of certified circular polymers is based on plastic waste processed at ExxonMobil's advanced recycling facility at its integrated site in Baytown, Texas. The facility began operations in 2021 and has already processed more than 4 million pounds of plastic waste.

The operation in Baytown will be among North America's largest advanced plastic waste recycling

facilities, with a capacity to recycle 30,000 metric tons of plastic waste per year when its expansion is complete later this year. Leveraging ExxonMobil's existing assets, the company's advanced recycling capabilities can be rapidly scaled to process a wide range of plastic waste. To help meet the growing demand for certified circular plastics, ExxonMobil plans to increase its annual advanced recycling capacity to 500,000 metric tons, or approximately 1 billion pounds, by year-end 2026 across multiple sites globally.

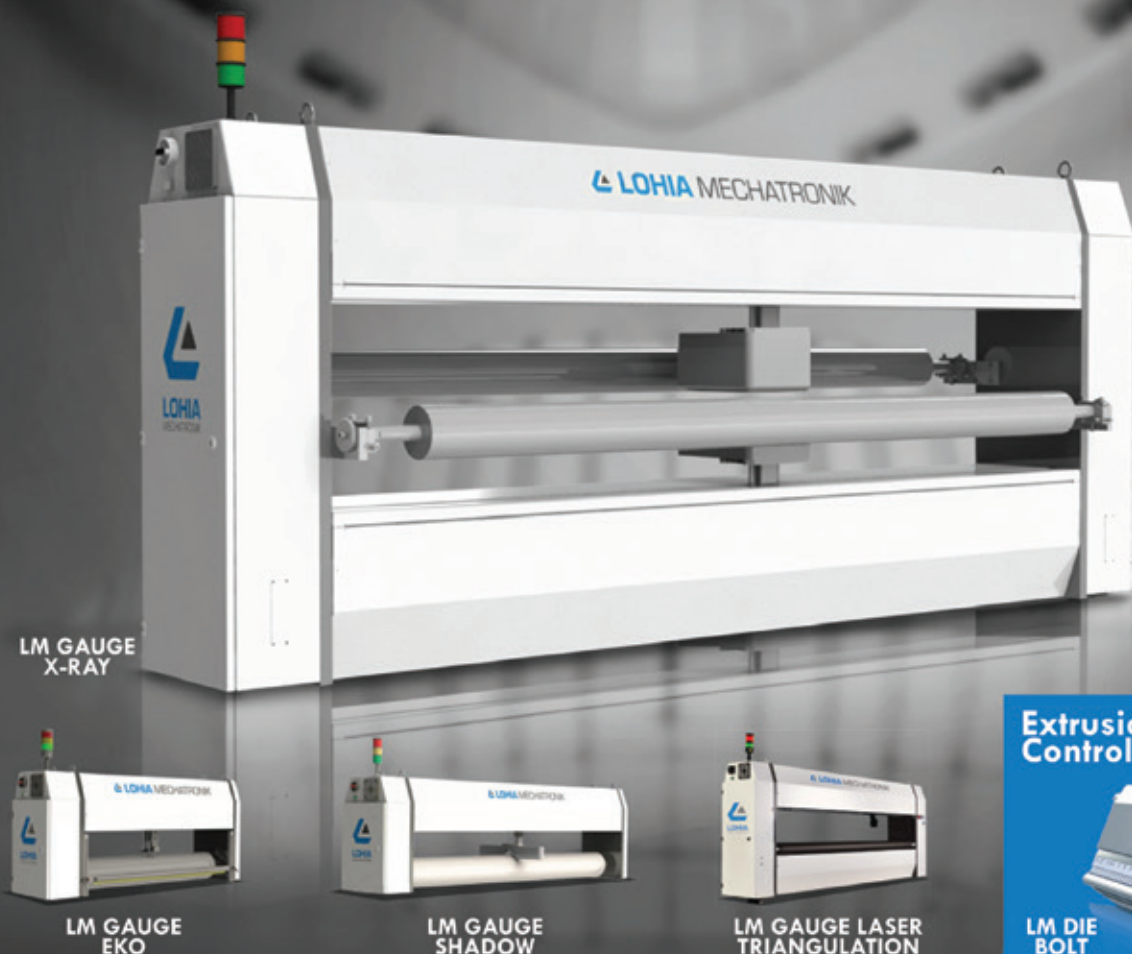
The company has obtained certifications through the International Sustainability and Carbon Certification Plus (ISCC PLUS) process for several facilities, including Baytown. The industry widely recognizes ISCC PLUS as an effective system to certify the circularity of products based on advanced recycling using mass balance attribution of plastic waste.

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Procter & Gamble India Becomes 'Plastic Waste Neutral'

Procter & Gamble (P&G) India has announced that it has become 'plastic waste neutral' in the past year (April 2021 – March 2022). P&G has collected, processed, and recycled over 19,000 MT of post-consumer plastic packaging waste from across the country, more than the amount of plastic packaging in its products sold in a year. With this announcement, the company is among India's first few FMCG companies to achieve plastic waste neutrality.

The company is working with recycling partners across 75 cities in India to collect plastic sent to different recyclers, waste to energy plants, and cement kilns. In addition to recycling, the company has also



made a deliberate effort to reduce the packaging material. In the last five years has reduced the usage of packaging material by more than 5,000 MT.

During its 'It's Our Home Sustainability Summit' held in Mumbai, the company made this announcement.

During the summit, P&G India also announced setting up two more in-house solar plants at its manufacturing sites in Goa and Mandideep in India. This is in addition to the existing in-house solar plant that the company set up at its Hyderabad manufacturing site in 2021. With this, P&G will be among the first few FMCG companies in India to have three in-house solar plants across its manufacturing sites.

Madhusudan Gopalan, CEO, Procter & Gamble – Indian Sub-Continent, said, "We are taking a deliberate approach to reducing the impact of our operations, and setting up in-house solar plants is a step in this direction. We have made strong progress across our brands, supply chain, and operations with support from our partners and employees. We are fully committed to making a positive impact globally and creating a sustainable future for generations to come."

In recent years, the company has made significant progress on environmental sustainability, which can be seen across its operations and brands.

P&G is committed to accelerating action on climate change toward net-zero GHG emissions. P&G has set a new ambition to achieve net-zero greenhouse gas (GHG) emissions across its operations and supply chain, from raw material to retailer, by 2040.

Sundram Fasteners Recognised As Supplier Of The Year, Gets Approval For PLI

Sundram Fasteners Limited (SFL's) Powertrain Components Division has been recognised as Supplier of the Year by General Motors (GM) under its 30th Annual Supplier of the Year Awards. This is the ninth time the Chennai-based auto component major has received the coveted recognition, underscoring its consistent excellence in the quality and ability to meet global engineering benchmarks.

The reputed American automaker has honoured 134 of its suppliers from 16 countries with supplier of the year distinction in 2021. The awards are an acknowledgement of global suppliers that have distinguished themselves by exceeding GM's requirements, resulting in providing GM customers with innovative technologies and high quality.

Winners of the supplier of the Year awards were chosen by a global team of GM purchasing, engineering, quality, manufacturing and logistics executives. Parameters for evalua-

tion were Product Purchasing, Global Purchasing and Manufacturing Services, Customer Care and After-sales and Logistics.

Sundram Fasteners has been a GM vendor for over 25 years and has won the Supplier of the Year award five times in a row from 1996 to 2000, and in 2009, 2019, 2020 and now, in 2021.

SFL gets approval from MHA under PLI Scheme

The Ministry of Heavy Industries (MHA) vide its letter dated March 22, 2022 has approved the application submitted by the company under Component Champion Incentive Scheme of the PLI.

The PLI Scheme aims in building a robust supply chain in areas of Advanced Automotive Technology (AAT) components. The eligibility criteria require minimum investment of Rs. 250 crores over five years with



at least Rs. 100 crores in the initial two years.

The company, out of capital expenditure amounting to Rs 2,000 crores planned over a period of next five years, has a projected investment of over Rs 350 crores for manufacturing AAT components like powertrain sub-assemblies for EVs and select Internal Combustion Engine (ICE) vehicles. The company has secured firm orders from global OEMs for supply of these components under their EV programs.

Arathi Krishna, Managing Director, said, "The PLI scheme will benefit the sector in multiple ways by increasing localisation and make India an export hub in the global auto supply chain. We are setting aside around INR 350 crores for the manufacture of advanced automotive technology components for the next five years."

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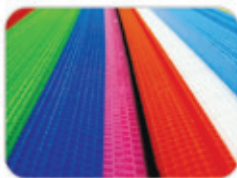


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Piyush Goyal Exhorts Indian Plastic Industry To Turn Into \$100 Bn Market in 4-5 Years

Union Minister for Commerce and Industry Piyush Goyal exhorted the Indian plastic industry to take the sector from the current level of around Rs 3 lakh crores of economic activity to Rs 10 lakh crores in around 4-5 years. The Minister said that this would be a national service from the plastics industry; this will create at least 1 - 1.5 crore jobs, which the country needs today.

Addressing the 'Export Excellence Awards 2017-2021' of apex plastics industry trade body The Plastics Export Promotion Council (PLEXCONCIL) in Mumbai, the Union Minister said that he sees the industry as one which gives a lot of impetus for job creation, especially in MSME sector, with the potential to provide jobs to many people from marginalised sections who have been left behind in the development cycle.

The Minister called upon the plastic industry to emerge as a bench-



mark for quality & carve its way towards a larger global market share.

He told the industry that it needs to reduce the volume of imports and become self-reliant. The volume of 17 billion dollars imports shows a clear market waiting for us to capture, said the Minister. "With an economy growing at 7-8 per cent for next 25 years, I am sure making the plastics industry a \$100 billion dollars industry in next 4-5 years is very much achievable. We must aspire to reach that level."

The Minister asked the industry to think big and expand its global

footprint. "Free Trade Agreements with UAE and Australia, which we have signed recently, will open opportunities for you in contemporary sectors, but this will be possible when we embrace international standards, so see how we can get a larger share of the pie in developed economies," he said.

Goyal emphasised the importance of upholding world-class quality standards. The Minister reiterated his appeal to the industry to upgrade technology and enhance the scale of operations.

Pitching for sustainability in the sector, the Minister said that we need to demonstrate to the world that Indians are environmentally conscious.

The Minister commended the industry, especially the plastic industry, for standing up and achieving challenging targets during COVID-19 and in the ongoing global situation in the wake of the war.

UFlex-Asepto To Launch India's First U-Shape Paper Straw Line

UFlex Limited, India's largest flexible packaging material solution and polymer science company, has announced its initiative to bring a sustainable change to its fold by setting up India's first U-shaped paper straw manufacturing line for its aseptic liquid packaging business. The manufacturing line is set up at its existing aseptic liquid packaging plant in Sanand, Gujarat.

By becoming India's first and world's fastest-speed line U-shaped paper straw manufacturing company, UFlex, through its aseptic liquid packaging brand Asepto continues its efforts to create a sustainable and clean environment. The paper straw manufacturing line will boast of fully automated Dutch technology, offering a production capacity of approximately 2.4 billion straws annually.

The sizes available in U-Shape paper straws will be 145mm and



165mm, attached to and utilized for portion packs for juices and other beverages. UFlex paper straws will be food grade, moisture-resistant and made from sustainably sourced papers, which are 100 per cent recyclable.

On the launch of the new line, Ashwani Kumar Sharma, President & CEO, Aseptic Liquid Packaging Business, UFlex Ltd, said, "In the wake of prohibitions on the use of single-use plastic coming into force across the world, including Indian government upholding its decision not to exempt some plastic straws from the impending ban, this move by UFlex is not

just significant but also timely. With the launch of U-shaped paper straws, we are ready to change the dynamics of the industry."

"After the successful installation and commissioning, we aim to attain 100 million straw production in the first month and raise it to 200 million in the next few months. We aim to produce 2.4 billion straws annually. The aesthetics and quality of the product are at par with global standards," he further added.

In FY2021, UFlex announced a doubling of its aseptic liquid packaging capacity to 7bn packs per annum in Sanand. The project near completion is currently undergoing trial runs. The latest paper-straw line initiative by UFlex will catapult the aseptic liquid packaging industry into a different league altogether. It will add yet another sustainable edge to UFlex's business approach.

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“Man, machine and material give organisations holistic, value-driven insight”

...mentions **Praveen Arora, Vice President - Internet of Things, Tata Communications**, in a conversation with ET Polymers. He divulges into how the adoption of IoT has a bright future in India, how they are working on navigating through cyber risks and more. Edited excerpts...

Where does India stand in terms of the adoption of IoT in manufacturing? Have we begun adopting the IoTs in manufacturing, especially if we talk about MSME? Are they ready to accept the change in their mindset to adopt IoT?

The shift that we see, especially in the digital adoption, around IoT has been significant in the last 2-3 years. There has been a lot of upscaling in the industrial segment, and the technology adoption rate has increased significantly. More and more CXOs are now focused on it. Additionally, Covid-19 has also accelerated the need for technology adoption. Given that the government and the industry bodies provide many initiatives, this has also led to the acceleration of the adoption of technologies. I believe the entire thing has been accelerated or rather pilled ahead for about five years.

Now, coming specifically to IoT, we see two things as a trend in terms of adoption.

1. Evolving need for ensuring the productivity be it man, material, or the machine. It is extracting the resources most efficiently. Also, we see that India is very feudal, where everyone looks for the return in the smallest investment, reducing the non-value adding activities in the process. So being digital is defiantly benefiting that.
2. Safety and security are now essential for people. It is helping many connected workers with operations related work in the industry. It yields the benefits of workers' safety and ensures



“IT’S ALWAYS BEEN A RACE OF HACKING V/S DEVELOPMENT. SO, WE LOOK INTO MULTIFACETED DEPLOYMENT PARAMETERS, WHICH INCLUDE A LIST OF STANDARD INSCRIPTION PROCEDURES TO SECURE BACKUPS, NETWORKS AND DEVICE USAGE, AND CREATE A FIREWALL AND ENCRYPTION”

workers' productivity. It's also about getting unified insights, ensuring that the operations run smoothly, connecting all the man, material and the machine, basically how the executives can run the operations and take the business decisions. These two things get very closely tied.

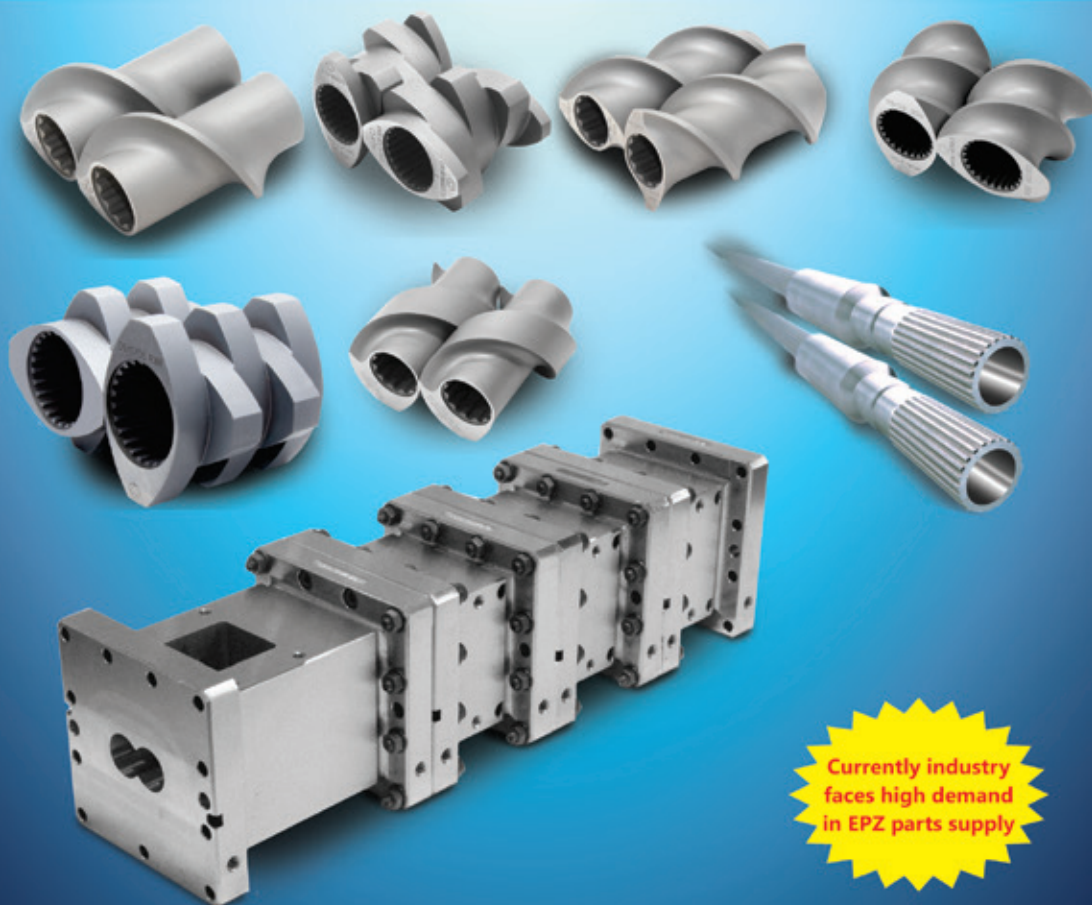
How is Tata Communications enabling enterprises to derive these unified insights as far as the IoT's are concerned? Is it been difficult or easier for you towards the change of mindset?

In India's manufacturing industry, the mindset is very rigid, and unless and until you do it in person or in

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the shop, the results aren't visible. However, that feeling does not exist for IoT or the virtual.

Ideally, a few years back, let's say 2-3 years back, the Indian ecosystem was very fragmented in terms of start-ups; roughly around 70 per cent of start-ups are there. The solutions enterprises are now looking towards is the bigger game or benefit across the organisational benefits. The point solutions don't help in one device, two devices, or a particular technology. They may not help in achieving that. So we have worked explicitly on enabling it. We have the network layer, which is the backbone. We have an ecosystem of devices and invested in catering to the Indian market as per the needs of the industry segment. We are designing the products in-house, in line with the Make in India initiative, to cater to the industry needs. So this fragmented ecosystem can join together on one particular platform and form a thread, and with that application insight and analytical insights, we're providing end-to-end solutions to the customers.

We're supporting the complete stack of the solution, not just one particular device or an application, layer or maybe a network layer. We provide a comprehensive suite of it that is Made in India.

Can you elaborate on how 3M is helping to improve manufacturing productivity?

There are several solutions around IoT that we have implemented at scale across multiple industries and enterprises. So, the improvement in productivity or efficiency can directly be measured in terms of cost, time saved, or the non-value adding time deduction.

When added as asset management together, man, machine and material give an integrated view of the productivity, reduce cost and non-value adding time, and wait for



time reduction of the finished goods and inventories. So all these pieces are the different valuables for which we give the organisation a complete holistic value-driven insight.

Can you give us an example of where the 3M elements have benefitted any enterprise? Also, if you have a case study to showcase.

So, in man, material and machine, there are significant implementations. I'll take an example of a resources company where we have deployed solutions at scale covering 30K workers and where the solution helps benefit saving along with several lives and productivity enhancements across the various plant ranges that I mention.


These are spread across 20-25 different locations covering around a few tons of plants or maybe touching about 100 plants or so locations within that particular zones. These are then linked together from safety, productivity, and a material movement done by asset management & inventory management. These pieces are tied together on centralised dashboards, which we provide as consumable APIs to integrate with the clients' SAP and ERP systems. They can then integrate their day-to-day operations and reporting functions concerning their activities.

In terms of adoption, it has been

at a breakneck pace. The Indian enterprise IoT market is approximately 36K crores as of 2020 and is expected to grow about 8-9 per cent CAGR to reach 46K crores by 2023. If you look at it, it consists of multiple pieces, where probably the device is forming about 40-42 per cent of that particular share, followed by 6 per cent on the network. And then, the services are how the adoption takes place and how you run the revenue and the share.

Additionally, we have seen growth where the customers in the enterprise segment are looking for a holistic solution. They are looking at integrated solutions to increase 10 per cent productivity or reduce near-miss incidents by 50 per cent to enable remote monitoring and auditing. Similarly, logistics are moving toward reducing inventory holding cost, lead time, and turnaround time, so those are specific parameters we rolled upon.

Cyber security is one of the significant challenges of IoT-based systems. How are you addressing the concerns as if anything goes wrong, then the entire data is vulnerable?

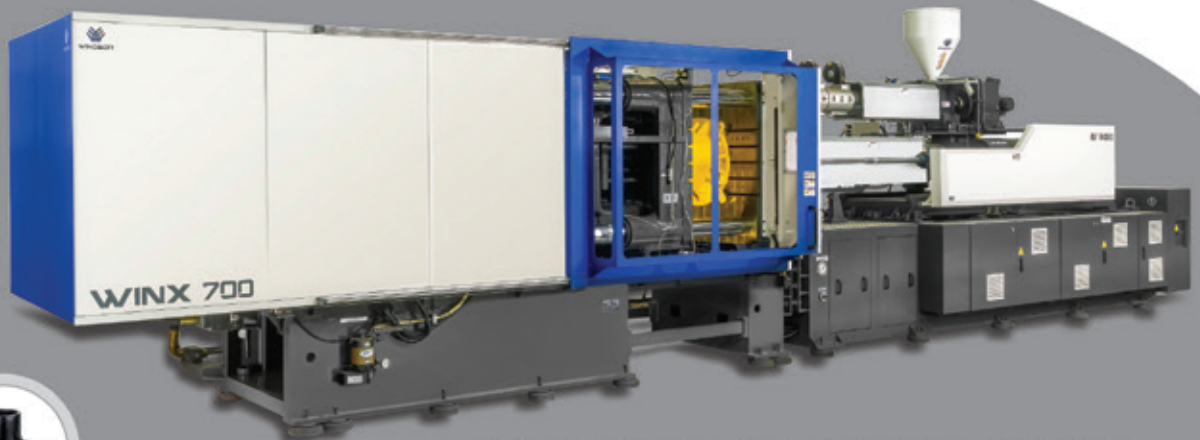
The threat to IoT is significant and will always be, not just in India but worldwide. It's always been a race of hacking v/s development. So, we look into multifaceted deployment parameters, which include not just a list of standard procedures of inscription to secure backups, networks and device usage but also to create a firewall and encryption. Plus, there is a constant evolution in the security parameters, like vulnerability and threat assessments. So, if there are any such cases, we block them right at the stages of our different checks and cycles. IoT operations are the core, multiple rings secure different layers, and we try to defend the multiple threats from those security aspects. So far, it's been safe in operations, deployment, running the operation, and delivering the output. 



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Lithium Price Rise: Impact & The Way Forward

There has been a persistent ignorance and lack of knowledge occurring when hundreds of variants of greases are available in industries. Additionally, with technology development and the price hike in lithium due to the Eurasia war and other external factors, companies might want to look at superior MFG thickeners such as calcium sulfonate. The article elaborates on the sustainable merits of thickeners such as Calcium Sulfonate.

By Ajay Shah, Managing Director, Molygraph Lubricants

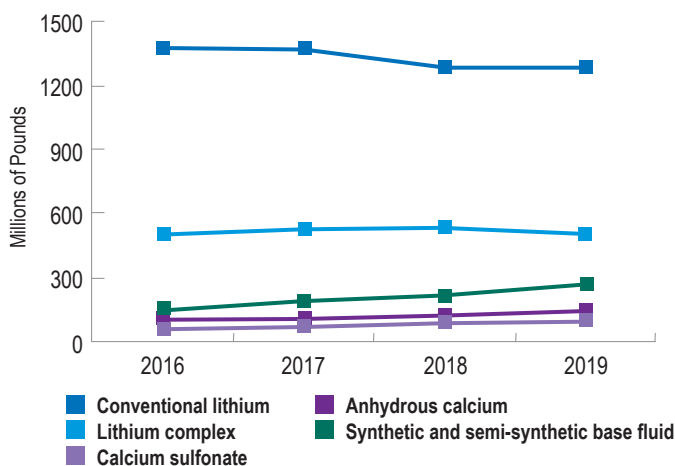
Industrial greases have evolved over the years and are an essential part of millions of components. There are hundreds of variants available to choose from, but the overall ignorance and lack of knowledge persist when it comes to choosing the right grease for the given machine or component.

Greases are classified into nine consistency grades (000, 00, 0, 1, 2, 3, 4, 5, 6) established by the National Lubrication and Grease Institute (NLGI). NLGI #000 greases are nearly fluid, while NLGI #6 greases are nearly solid. The most commonly used grease is NLGI #2 & #3. The popular industry nomenclature is EP2 & EP3 greases.

One of the prominent reasons for the popularity of MFG greases is their overall best price-performance ratio. Industrial users often find it convenient to use MFG grease since, by default, they fit into standard applications without a need for an elaborate assessment and whenever the user is not very clear on which grease to use,

Global Grease Production, 2016-2019

Calcium sulfonate and anhydrous calcium greases are slowly gaining ground at the expense of lithium. Synthetic base oils are also climbing



Source: National Lubricating Grease Institute
LubesnGreases.com

Dominance of lithium-based greases

Lithium-based EP2, EP3 grease has been the most commonly used

grease due to its all-round properties in terms of withstanding high temperature and water-resistant properties. It is so commonly used that it accounts for 75 per cent of all lubricating jobs across all industries globally.

Over a period of time, technological advancements have made available superior alternatives to lithium as an MFG thickener material, the most promising being Calcium Sulfonate. However, due to industry users' years of comfort and largely owing to the cost economy, the lithium-based EP2, EP3 greases

OVER A PERIOD OF TIME, TECHNOLOGICAL ADVANCEMENTS HAVE MADE AVAILABLE SUPERIOR ALTERNATIVES TO LITHIUM AS AN MFG THICKENER MATERIAL, THE MOST PROMISING BEING CALCIUM SULFONATE. HOWEVER, DUE TO INDUSTRY USERS' YEARS OF COMFORT AND LARGELY OWING TO THE COST ECONOMY, THE LITHIUM-BASED EP2, EP3 GREASES HAVE ENJOYED CUSTOMER PATRONAGE AND A LARGER MARKET SHARE.

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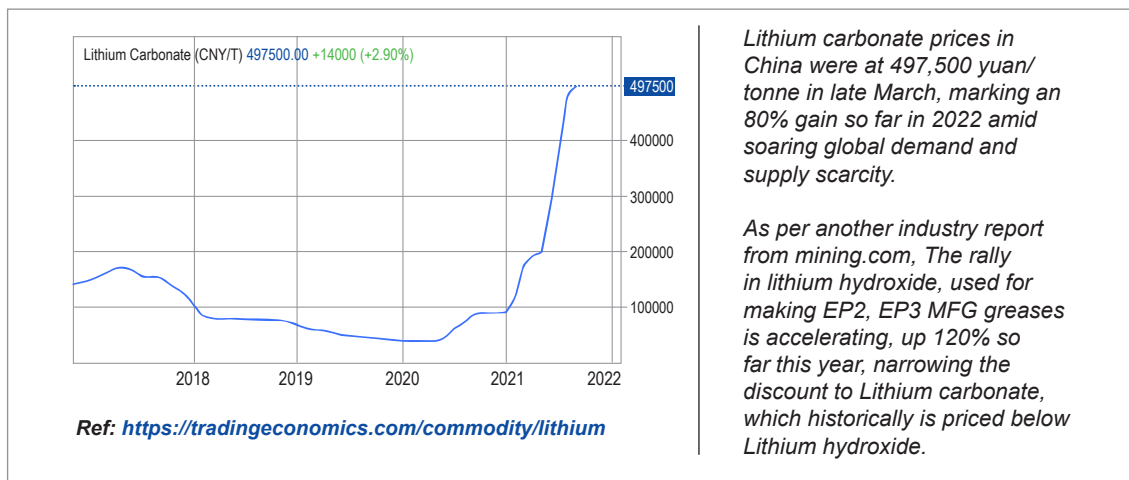
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have enjoyed customer patronage and a larger market share.

Changing market scenario

Till 2021, lithium-based MFG greases were selling cheaper than the Calcium Sulfonate based MFG greases. But came 2022, and the cost of the former started increasing mainly due to a rise in the core raw material prices.

Going by the industry data for India, between March 2021 and March 2022, there has been an unprecedented over 150 per cent increase in the core raw material for lithium-based MFG greases compared to less than 10 per cent increase in the core raw material for calcium sulfonate based MFG greases during the same period. (Ref: internal data of Molygraph Lubricants)

On the global front, circumstances have changed rather dramatically and suddenly by March 2022. There has been a spike of 80 to 120 per cent in the prices of Lithium variants (viz., Lithium Carbonate used in making batteries and Lithium Hydroxide used in making greases) worldwide, leading to inevitable price increase for the popular EP2, EP3 type MFG greases.

Performance comparison - Calcium Sulfonate vs Lithium thickener

| PROPERTY | DESCRIPTION | LITHIUM MULTI-PURPOSE GREASE | LITHIUM COMPLEX GREASE | CALCIUM SULFONATE GREASE | COMMENTS |
|---|--|------------------------------|------------------------|--------------------------|---|
| Stability | Mechanical Stability | +30 | +30 | <20 | A lower number is better |
| | Roll Stability | 8-10% | 8-10% | <5% | A lower number is better |
| High Temperature | Drop Point | ~350°F | ~500°F | +550°F | Higher drop point, better high-temperature properties |
| | High-Temperature Life | ~80-90 hours | ~80-100 hours | >120 hours | A higher number is better |
| Water Resistance | Water Washout (175°F, 1 hour, % weight loss) | 5-10 | 5-10 | <5% | A lower number is better |
| | Water Spray Off (% grease washed off) | >50% | 20-60% | <30% | A lower number is better |
| | Roll Stability in Presence of Water (2 hours, 10% water) | >10% | >10% | <10% | A lower number is better |
| Extreme Pressure | Weld Load (kgs.) | 250-400 | 250-500 | >500 | A higher number is better |
| | Timken (lbs.) | 40-45 | 40-80 | >60 | A higher number is better |
| | Wear Scar Diameter (mm) | 0.5-0.6 | 0.5-0.6 | <0.5 | A higher number is better |
| Compatibility with Lithium Greases | | | Very Good | Good | Easy for changeover |

Ref. article in Machinery Lubrication magazine (<https://www.machinerylubrication.com/Read/29658/multi-purpose-grease>)

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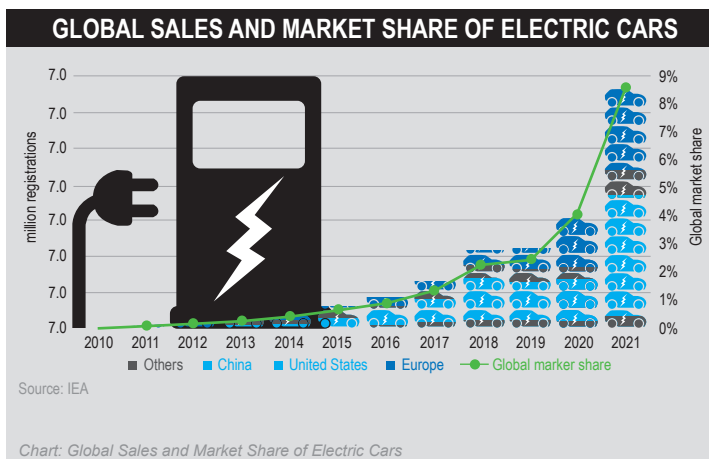
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Ref: <https://www.thestreet.com/investing/futures/cobalt-lithium-demand-on-the-rise-heres-why>

The IEA estimates that demand for lithium may increase up to fortyfold in 20 years' time

In the case of lithium, prices rose as supply was not able to keep up with rampant demand. And that is despite lithium supply increasing 22% from 2020 to 2021 according to S&P Global Market Intelligence. Surging energy prices due to Russia's invasion of Ukraine strengthened the appeal to transition away from fossil fuels, adding to the booming demand of electric vehicles. After rising 157% to 3.2 million units in 2021, electric vehicle sales in China are expected to cross 5 million in 2022.

The blessing in disguise

While the prices of lithium-based EP2, EP3 greases keep rising, for its superior alternative, Calcium Sulfonate based MFG greases, the prices have stayed relatively stable. So much so that as a result of this sudden price increase in the Lithium raw material, the superior Calcium Sulfonate based MFG greases are now selling at a price lower than the popular lithium-based EP2, EP3 MFG greases.

This is a kind of a blessing in disguise for the users across industries. They now have a strong techno-commercial case to switch to the superior Calcium Sulfonate based MFG greases.

Performance comparison - calcium sulfonate vs lithium thickener

Various studies and reports by industry evangelists have concluded that Calcium Sulfonate thickener based MFG greases have exhibited superior performance over lithium as well as Lithium complex thickener-based greases. One such reference article published in the renowned industry publication - The Machinery Lubrication quotes, "Calcium sulfonate, by virtue of its thickener property, provides excellent water-resistance properties

and does not break down even in the presence of water. However, limitations with calcium-sulfonate greases are their inferior pumpability and cost." The industry has since moved ahead with improved pumpability of calcium sulfonate based MFG greases.

Why the sudden surge in Lithium prices?

There are multiple reasons being discussed as to why the Lithium prices have suddenly increased and whether these will cool off to the earlier levels anytime soon?

Some industry experts are saying that the prima-facie trigger seems to be the current war situation between Russia and Ukraine. While this may be true to an extent, there seems to be a larger impact due to another key reason for the Lithium price increase over the last year, i.e., exponential demand for electric vehicles which run on Lithium-based batteries.


The way forward

If one looks at the situation holistically, it can be concluded that this increasing price trend in lithium could be irreversible in the foreseeable future. It means for the MFG grease manufacturers and users that the erstwhile price advantage of the lithium-based EP2, EP3 type MFG

greases could be gone forever. Currently, the price-benefit scale is tilted in favour of the superior Calcium Sulfonate-based MFG greases.

Talking in our context as a manufacturer of both these types of MFG greases, we at Molygraph lubricants are seeing a clear surge in demand for the superior Calcium Sulfonate based MFG greases from our customers as well as new buyers who were earlier reluctant to switch from the cheaper and popular EP2, EP3 type MFG greases.

However, before this changeover from lithium-based grease to Calcium Sulfonate based grease, one needs to do an assessment of 'compatibility' through the application expert. Though there is good material compatibility between Lithium and Calcium Sulfonate, one needs to take a holistic look at other parameters such as operating conditions, surface chemistry, process chemistry and the compatibility between other ingredients of the grease, viz. The base oil and the additives used.

Having ensured the application compatibility for a smooth changeover from lithium-based to Calcium Sulfonate based multi-functional grease, there seems to be sustainable merit in this transition for the industry users. 

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Transforming The Automotive Sector

The use of analytics in the automotive sector has transformed the mobility sector over the past few years- and how!

Automotive analytics refers to the process of uncovering essential data in the automotive industry, its interpretation and ascertaining trends and patterns from the data. Analytics in any business sector enables the discovery of insights and meanings which could have been otherwise missed. These analytics and insights are then used to make informed business decisions which could help the organisation towards increasing its sales, reducing costs or generally making business improvements.

The use of analytics in the automotive sector has transformed the mobility sector over the past few years- and how! If we look back at the past decade, it was of course the era of big data. Cloud computing made it possible for the largest to the smallest organisations to acquire massive amounts of data at low costs. The analysis of this data and how it was used, was of course a game-changer for all industries. In this article, we take a peek into how it has transformed the way automotive industries do business or potentially offers automakers a distinct advantage over their competitors.

Automobiles and big data

Vehicles are just more than transportation today- they are smart devices! Central to the idea of a vehicle being a smart device is the 'connected car'- a concept which has been around for quite some time and upon which advancements have been made on the car as we know it today. A connected car has data sharing, in both directions, with devices in the outside world as well as devices inside the vehicle itself. As the driver/owner of the car, it is vital to have access to data, such



as maps, traffic news and warnings, weather updates, news and other such real-time updates. On the other hand, connected entities, such as insurance companies, for example, need to have access to similar information about the car and its driver. This could be the mileage of the car, fuel consumption, system and components data, maintenance and warranty, driver skills, and so much more. Such information, collected and stored, can be vital for such things as safety, trip planning and of course for the automotive company to provide reliability, durability and comfort to the user of its vehicle.

In short, big data for the automotive industry is this exchange of a large amount of data, often difficult to handle, but the analysis of which enables the automotive company to provide its customers with better and safer vehicles. Automotive analysis has been key in shifting revenue streams for the industry at large.

Analytics across the manufacturing value chain

The power of analytics can generate exponential value in automotive man-

ufacturing, if applied effectively and across the entire value chain as below:

1. **Supply chain** - Optimisation and management
2. **Procurement** - Sales and transaction analytics
3. **Product development** - Process risk analytics, design, social crowdsource
4. **Manufacturing** - Workforce analytics, operational planning, asset inventory
5. **Transportation & distribution** - Inventory and distribution analytics
6. **Marketing**
7. **Customer sales** - Sales trend analytics
8. **Aftermarket**

From these eight value chain functions come four salient cross value chain analytics which we look at in-depth. These are:

1. Customer behaviour analytics
2. Marketing mix analytics
3. Supply chain optimisation
4. Predictive quality analytics

Analytics for customer behaviour

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ised and continue to drastically alter the methods in which customers research, buy and upkeep their vehicles. Automobile manufacturers have had to respond to these changes by offering around the clock connectivity, increased number of access channels for purchasing, and reliance on the internet and social media as important research and communication tools. The role of the traditional car dealer has come into the grey zone and innovative sales processes are being brought into play to take advantage of the opportunity to differentiate and provide unique retail experiences.

To develop differentiated and compelling offers, automakers need to fully understand customer behaviours and needs. There is a lot of data available to help automakers understand their customers, but the complexity of this data hampers the process of analyzing and acting upon it. Customer retention also needs to be given considerable thought, which raises the need to understand and influence the customer experience not just during the purchase, but also across the entire lifecycle of the vehicle.

All these factors require data integration across the organisation and the creation of a single, integrated view of your customer. This integration will include the aggregation of both internal and external sources – from customer relationship management systems to dealer management systems to sales demographic, and many more.

This collection of data is next made useful through analytics which creates meaningful and actionable segments which allow the automaker to formulate differentiated product offerings for each segment.

If automakers want to build a more solid, data-driven business, then it is essential to build a solid analytics platform. This will produce actionable insights that, when used correctly, can improve customer ex-

periences and improve marketing campaigns. Analytics in post-purchase behaviour enables the formulation of retention campaigns and maximises aftermarket penetration.

Analytics for marketing management

Analytics in marketing spending, both fixed and variable, enable automakers to better understand which marketing campaigns are working and which are not, and develop more nuanced approaches towards the same. The growth in the number of information touchpoints available to customers allows both automakers and dealers to focus on specific groups with better-targeted messages and offers. This increase in data and the ability to track consumer behaviour also offers the opportunity to precisely configure optimal marketing mixes.

Whilst marketing analytics can significantly improve decision making by consistently analysing marketing information, there are some challenges to the process, such as lack of information on sales of competitor brands; poor understanding of competitor marketing strategies and their impact; limited ability in understanding the impact of more general patterns and trends.

Through marketing mix analytics such as evaluating sales and marketing trends, it is possible to quantify the contribution of marketing activities over a while for different geographics. Over time, this can be utilized for scenario-based marketing planning, budget allocation, media optimization strategies, etc. It is therefore vital that expectations are aligned to the kind of data available. For most automakers, this will initially involve the creation of a performance dashboard which displays a range of easily digestible data which allows a better focus on marketing spending. Once this is embedded and the analytical capability of the organisation continues to evolve,

scenario-based planning can be done.

Analytics for global supply chain management

Automotive manufacturing operations today are highly globalized to take advantage of high-growth markets and cheaper manufacturing costs. But this globalization of operations also extends considerable pressure on companies seeking to effectively manage their global supply chains. Analytics for global supply chain management involves the use of data analytics to manage risks as well as drive growth. There are many factors which can have a significant impact on the ability of automotive manufacturers to manage their supply chains – the COVID 19 pandemic, is a good example. These factors could also include availability and/or shortage of raw or parts materials, government, and political constraints such as the embargoes due to the Russian-Ukraine conflict, and many more. Get your supply chain management right and you can have a considerable competitive advantage as well as an opportunity to gain big. Get it wrong and you could find yourself embroiled in various challenges ranging from government scrutiny to lost opportunities for growth.

The good news here is that in the face of these complex challenges there are vast amounts of data available and being generated every day to help automakers optimize their supply chain. In fact, following the pandemic, some product recalls, and other events – such as the shortage of semi-conductors – several companies are looking at the data available to them to try and mitigate future supply chain risks in similar situations.

Advanced supply chain analytics represents a major operational shift away from reactive management to a proactive management model, which means that automakers are preparing themselves to be able to continually sense and respond accordingly to

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surrounding changes. Additionally, supply chain analytics helps the vehicle maker to analyze larger sets of data with techniques such as stochastic modelling, regression analysis and linear and non-linear optimizations. This means a considerable improvement in how powerful big data tools can help drive actionable insight for automakers.

A simple example of this can be illustrated through the use of product configurations and other web interactions which allow the automaker to quickly identify emerging trends such as preferences for certain car colours or features such as automatic gearboxes.

These analytical tools and methods allow the automaker to identify correlations which may have been less visible or maybe even missed completely in the past and allow them to look at their supply chains from a more holistic perch. Advanced analytics and cloud-based big data platforms are already showing us a different global supply chain- a better connected one and prepared to predict and react and proactively manage supply chain risks through simulating possible, alternative solutions.

Predictive analytics

One of the most vital applications of advanced analytics is in the management of product quality and recall management. The quality management team within an automotive manufacturing operation walks the tightrope between customer satisfaction, cost control and regulations.

With the use of predictive analytics, however, this becomes a little simpler. The capabilities of predictive analysis today have allowed issues with quality to be detected early enough to formulate adequate action in time or prevent the issue from occurring altogether. This in turn improves quality management and thus manages cost control concerns and customer satisfaction.


Successful automakers have to be more proactive about detecting and responding to care quality and safety issues and herein lies the potential for predictive analytics. Good analytical systems can process huge amounts of data and provide various analysis methods to identify possible faults in advance. For example, detailed analytics of the aftermarket through social media, customer service points and part sales can be used to build a view for manufacturers of which specific part of the automobile is facing issues. Comprehensive forecast models can help identify the possibility of a product recall, with a timeframe to it, which enables the automaker to take corrective action before regulatory authorities get involved. Analytics models will also help to identify part defects from suppliers in advance.

It is evident from these possibilities that predictive analytics is particularly useful when developing prototypes, managing quality, optimizing supply chains and managing recalls.

In conclusion

Globalisation, shifting market conditions, cost pressures and market vola-

tility have changed the automotive landscape. Technology has changed and continues to change at an astonishing pace. The automotive industry remains on the brink of irreversible transformation with autonomous vehicles and smart vehicles changing how we buy, own, and drive a car. As the traditional automobile transforms, so does everything else in its ecosystem. Automotive manufacturers have to increasingly make themselves agile to respond to these changes, and analytics is key to this. Analytics software allows different data to be merged and deliver impressive, cohesive, nuanced results for the manufacturer of today.

The automotive industry, when compared to other sectors such as banking or retail, still seems to be playing catch up when it comes to effectively using analytics to gain customer insights and optimize marketing budgets. However, if done right, automotive analytics can potentially reveal nuances such as the specific impact of a particular vehicle model, within a specific geographical location or even for a specific customer. This is invaluable insight for the automaker of today, who is adopting a more customer/customised driven approach rather than the product-driven approach. Combining analytics with suitable dashboards and planning tools will enable all original equipment manufacturers to optimize operations across their entire value chain. Additionally, analytics also helps optimize transparency, drive efficiency by identifying areas of improvement and automating processes; generate strategic insight for future scenarios and enables collaboration across the value chain. The global automotive sector is vast and whilst the sheer scale of data available may appear intimidating from a distance, the possibilities the data offers through analytics, can no longer be ignored by any automobile manufacturer. 



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“Think durability, recyclability, and reusability”

The concept of circular economy has been gaining prominence globally. It's time India embarks on it, too. Mark Vester, Global Leader - Circular Economy, SABIC, elaborates on the circular economy, its benefit, how companies can implement it, and more. Excerpts...

By Anvita Pillai

The circular economy being a new concept, can you elaborate on what circular economy is? How does it differ from recycling?

A circular economy is restorative and regenerative by design. It means materials constantly flow around a 'closed loop' system, rather than being used once and discarded. In the case of plastic, this means simultaneously keeping the value of plastics in the economy without leakage into the natural environment. The key goal of a circular economy with respect to plastics is to ensure that it never ends up in the environment, landfills, or in our oceans – instead, it is reused and remade into valuable new products.

This model of production and consumption involves sharing, leasing, reusing, repairing, refurbishing, and recycling plastic products if possible. In this way, the life cycle of products is extended. When a product reaches the end of its life, its materials are kept within the economy wherever possible. These can be productively used repeatedly, thereby creating further value.

In the face of our current environmental challenges, recycling won't be enough, as recycling begins at the end of a product cycle. In contrast, a circular economy goes right back to the beginning to prevent waste and pollution from being created in the first place, thereby making it a more sustainable practice and preventing more waste from being created.



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The plastics and polymers industry is still experimenting with sustainability. How can these industries incorporate a circular economy into their business? How does it affect a company's value chain?

Several industries, including plastics and polymers, are still experimenting with incorporating a circular economy into their business models. It is understandable as it is challenging, and taking the wrong approach can be expensive. A big reason for this is the limited availability of renewable feedstocks. Since demand for plastics cannot be met with recycling and renewable feedstocks only, businesses are forced to continue using other feedback and resources, including fossil fuels. Another big reason is that technologies for especially advanced recycling are often still immature and require further development.

However, despite these challenges, organisations can create a circular business model in many ways. One way is to keep in mind the products in use – whether you are designing new products or packaging, think durability, recyclability, and reusability to keep components and their circularity in the economy. Another way is to ensure the use of tailored resins for the development of products that have improved recyclability characteristics and to produce plastics and polymers using renewable feedstock or feedstock recycling and decarbonisation efforts in the value chain.

Can you elaborate a bit more on renewable feedstock? How can India adopt it on a larger scale?

A renewable feedstock is essentially any natural resource that can replenish itself in a limited time, preferably within several months, although a few years may be acceptable. India has abundant renewable feedstock and has the highest plastic recycling rate, with estimates ranging from 47 to 60 per cent. India being an agri-

“IN THE FACE OF OUR CURRENT ENVIRONMENTAL CHALLENGES, RECYCLING WON'T BE ENOUGH, AS RECYCLING BEGINS AT THE END OF A PRODUCT CYCLE. IN CONTRAST, A CIRCULAR ECONOMY GOES RIGHT BACK TO THE BEGINNING TO PREVENT WASTE AND POLLUTION FROM BEING CREATED IN THE FIRST PLACE, THEREBY MAKING IT A MORE SUSTAINABLE PRACTICE AND PREVENTING MORE WASTE FROM BEING CREATED.”

culture-based economy producing tonnes of rice and grains, conversion of rice husk into cellulose can be a major source of renewable feedstock, which can be used by various industries as fuel. SABIC is helping petrochemical businesses utilise these feedstocks to make them suitable for the entire petrochemicals value chain by making usable plastics rather than the fuel.

India can scale the adoption of renewable feedstock by employing the right technologies to leverage the feedstock it produces not only for the country's domestic use but also to provide feedstock for renewable petrochemical industries.

What is SABIC doing in terms of a circular economy? How are you helping create an entire process of circular economy?

Focused on growth, SABIC's vision is to ensure plastics are reused and remade into new products. This vision requires a total transformation of the value chain. Our TRUCIRCLE™ portfolio and services play a significant part in achieving our vision and closing the loop on used plastic.

With TRUCIRCLE™, we want to give manufacturers access to more sustainable materials, Mechanically Recycled, Certified Circular, and Certified Renewable. That way, they can provide the end-consumer more confidence about buying products with the knowledge that the material can be recycled and repurposed

or that it has been produced in a way that can help protect resources.

After pioneering circularity in Europe, we are now working globally with renewable feedstock and advanced recycling with our TRUCIRCLE™ program, including India. Our Indian team in the company's state-of-the-art SABIC Technology Center (STC) in Bengaluru is conducting innovative research into new platforms for future-proofing innovative solutions for circular economy in general and across industries like Construction, Clean Energy, Electrics and Electronics, Medical Devices, Transportation and more. We are also designing greener building materials to reduce environmental footprints and developing eco-friendly products in response to global needs to facilitate businesses incorporating circularity in their operations.

How will it be financially beneficial for an organisation to implement the circular economy?

Many of these economic benefits and opportunities are long-term, indirect and require significant investment; a long-term view is key, as are short-term incentives to drive the change. This can include policies that create more immediate financial incentives for businesses to develop innovative new business models and enable the efficient flow of reused and recycled materials across global value chains.

For instance, the UK announced a new tax on the manufacturing and importing plastic packaging that

contains less than 30 per cent recycled content. This has nudged them to absorb the additional costs of purchasing recyclable plastic for their purposes. With proper regulation, brands will be less likely to compare the costs of recycled and virgin plastics. Therefore, decoupling the price of these two materials will support the business case for the material going forward, as it then becomes a supply-demand issue, independent of the source.

India has waste segregation problems on several levels. Would the government be willing to establish such regulations in place? Secondly, will the companies continue manufacturing in India with such stringent regulations?

I am more than optimistic about the Indian government's commitment to the environment. Prime Minister Modi has set a shining example in front of the world by committing to carbon neutrality by 2070 at the COP 26 Summit in Glasgow last year.

Encouraging resource efficiency by using virgin plastics more efficiently and using recycled plastics in production will create greater demand for recycled plastics upstream in the supply chain. This will also expand incentives for increased collection and recycling of plastic material downstream. Steps that encourage and facilitate the transition from a linear economy to a circular economy are important. They will help maximise value extracted from resources whilst in use, then reused, remade and recycled to their full potential to minimise waste.

In your opinion, how far are Indian plastic and polymer companies from even building an entirely circular economy? On average, how many years would it take for them to, you know, have a fully functioning circular system?

While it is impossible to give an exact date, the Circular Economic

Roadmap for Plastics in India looks promising. India is leading the way in reducing plastic waste in as many ways possible. It has also become the first Asian country to launch the India Plastics Pact this year which targets to enable businesses to transition towards a circular economy for plastics by 2030. This initiative aims at identifying a list of unnecessary plastic packaging items and take measures to address them through redesigning and innovation; 100 per cent of plastic packaging to be reusable or recyclable; 50 per cent of plastic packaging to be effectively recycled, among a few other measures; 25 per cent average recycled content across all plastic packaging.

For the companies who are just planning in this direction, what can be a good starting point for them to go on?

Sustainability and circular economies have gained even more importance after COVID-19. The pandemic has impressed the need for businesses to incorporate sustainability to be more resilient against such events.

A solution for organisations contemplating going 'circular' involves working with SABIC. Even as economies continue to deal with COVID-19, SABIC is helping make it possible to recycle more plastic. As part of our TRUCIRCLE™ initiative, we collaborate with companies to accelerate the recycling of mixed plastic waste back to its original polymer. SABIC partners in packaging are already manufacturing with "closed-loop" recycling, where the materials can be converted back into the original high-quality product.

India is an important market for us in Asia, and we are well placed to help companies in the region. For example, our innovation centre in Bengaluru delivers innovative products and solutions while harnessing local talent coupled with the infusion of global expertise and knowledge into India.

Can you tell us some of the key initiatives that SABIC has taken in the past year to address the plastic waste problem in India? Also, what is in the pipeline for 2022 in terms of circular economy and the cycle?

SABIC is one of the founding partners of the alliance to end plastic waste, a new global collaboration that enshrines the responsibilities and actions agreed by major plastics producers to support the Circular Economy. And with India planning to phase out single-use plastic (SUP) in 2022, the country is currently looking for more sustainable solutions. It is working towards making brands/manufacturers more accountable for managing the entire life cycle of plastic waste management. That is where our TRUCIRCLE™ portfolio and services play a significant part.

We endeavour to make our technology centre in Bengaluru, Karnataka, a carbon-neutral entity in the near future. In this journey, the site has already made considerable progress since its establishment in 2013. While the site has reduced its carbon footprint by more than 85 per cent by adopting processes and technologies which are more carbon efficient and green, we have also made considerable progress in building a culture and mindset of incorporating sustainability-based decisions in all our workings. SABIC has also made considerable progress at its manufacturing facility at Vadodara, Gujarat and has invested in installing a more energy-efficient production system by leveraging renewable energy.

SABIC seeks to play a bigger role in India as the nation's net-zero target boosts solar power and electric vehicles, creating demand for speciality plastics and chemicals. Our teams at the technology centre in Bengaluru are working to develop innovative solutions, including 5G enablement, electric vehicles, solar applications, and water management in India. 🌱



“Celebrate Women’s Achievements. Raise Awareness Against Bias”

In an exclusive interview, **Bhavana Bindra, Managing Director, REHAU South Asia**, talks about the company’s new venture into the modular kitchen segment, opportunities for India’s polymer industry and plans to increase revenue by 30 per cent in the current financial year.

By Rahul Kamat



How does it feel to make a mark in the male-dominated industry as the first women leader of businesses focused on automotive, mining, construction, railways and power generation, among other markets?

I have always believed in swimming against the tides - whether it was the decision to continue my career journey in India despite having several opportunities to plunge into bigger roles in the US and Europe or the conviction to make a place for myself in the engineering and manufacturing sector joining it at a time when the only women one saw there were in support functions. In 13 years of my association with Cummins in India, I ideated, strategised and launched the automotive business, which I later went on to run as its head. I directed one of their largest businesses- the Distribution Business and was responsible for

“I BELIEVE THE INDUSTRY HAS A HUGE POTENTIAL TO INCREASE THE MANUFACTURING OF PLASTIC MACHINERY IN INDIA AND REDUCE DEPENDENCE ON IMPORTS”

more than half a million engines of Cummins across the country.

I resonate with the statement, “A balanced world is a better world.” How can you help forge a more gender-balanced world? Celebrate women’s achievements. Raise awareness against bias.

I believe the skills one possesses are beyond any gender identity, and thus, we should never stop ourselves from achieving an equal opportunity irrespective of gender biases. It’s a world of equal opportunity for everyone and anyone. Hence, I see a future where no industry per se will be labelled as a ‘male-dominated’ or ‘female-dominated’ industry.

The company has clocked tremendous growth from 2011 to 2019, growing at a CAGR of more than 23 per cent with an omnichannel presence in India. What are your growth plans for the current FY, and how will you achieve them? What are the expansion plans?

REHAU is celebrating 25 years in India. Not too soon after establishing its Sales office in the country, REHAU set up its first manufacturing facility in Pune in 1997. Since then, REHAU has constantly been looking to augment its presence in the region, ensuring the production of goods for the Indian market while catering to exports. For REHAU,



“REHAU HAS PROJECTS AND COLLABORATIONS LINED UP THIS YEAR WHICH HAS MADE OUR GROUND STRONGER THAN EVER.”

making in India has been part of the strategy for the region, and we will continue on the same. Our current focus in this regard is to expand our kitchen category with the launch of REHAU Kitchen, the first-ever modular kitchen set up by REHAU. It is a proud moment for REHAU as we are on the path to becoming a one-stop solution for the end consumers. REHAU is also expanding its furniture category with its new hardware range launch. In the current financial year, REHAU has plans to increase its revenue by 30 per cent. We are also focusing on strengthening its after-sale service as a niche and premium brand. We always look for ul-

timiate customer satisfaction.

We are proud to be bringing German technology to serve the citizens of our country. We have established a leadership position for the markets and product segments that REHAU has been catering to over the years. We hope to extend the same into the newer segments and product categories we are expanding into. More to come as the story unfolds!

How do you differentiate REHAU Kitchen from its competitors?

The modular kitchen has REHAU's European quality edge banded panels. The hardware and accessories used are also of international quality,

promising strength, resistance and durability. Every REHAU Kitchen uses the brand's newly launched RAUVISIO quartz stone as kitchen slabs that are considerably more hygienic and easier to clean due to its polished surface and fibre-free material, giving a feel of natural stone. The Roller Shutters used in a REHAU kitchen are imported from its German plant for storage solutions. The Plinth cover used in the modular kitchen set-ups is manufactured at REHAU's India factory.

The experiential store in Bengaluru is spread across a 2,000+ sq. ft. area and consists of three Kitchen units for display. The brand offers 100+ surface finishes and colours for consumers to customise their own REHAU Kitchen without limiting their imagination and creativity. REHAU is known for providing German-engineered products at competitive market prices. Thus, consumers looking for international quality modular kitchens need not look any further with REHAU kitchen entering the market. The brand provides



an end-to-end solution to its customers starting from recce to installation with a shorter delivery time and quick after-sale service.

What are the growth opportunities for India's polymer industry, and how is it likely to achieve a turnover of Rs 10 lakh crore by 2025?

The Government has asked the industry to explore ways to achieve its full potential and triple the sector's overall turnover to Rs 10 lakh crore by 2025. I believe the industry has vast potential to increase plastic machinery manufacturers in India and reduce dependence on imports. The target is achievable for which all-round reform measures are required with policy support from the Government. Today's polymer-based products are lightweight, sturdy and come with various variations to choose from. Gen-Z and the millennials prefer user-friendly, nature-friendly, and aesthetically appealing products to the eyes. Thus, if we look from the market perspective, the polymer industry has a huge scope to explore and expand its avenues while being innovative in its approaches.

REHAU is in sync with the Government's vision of using world-class machinery for manufacturing superior quality products as we use German technology. Every product passes through stringent quality checks. REHAU's polymer-based products promise a sustainable environment for generations to come as we believe in the 'Planet First' concept globally. REHAU has a manufacturing capacity geared up to meet the rising demand for quality-conscious customers. And it's not just us; the entire polymer industry is gearing up to enhance its production capacity with each passing day. The sole purpose of the industry is to manufacture polymer-based products on the ground, generate more employment, and add up to the country's national growth. Thus, to sum up, I would say that the polymer industry is moving in



the right direction to contribute to our government's vision of achieving a Rs 10 lakh crore turnover in the next five years.

For more than 70 years, REHAU has been working on making polymer products lighter, more comfortable, safer and more efficient. What are the new edge solutions by the company for the Indian market?

The product that created a place in the market and people's hearts and has maintained its stature for the last 50 years is our best-selling product, RAUKANTEX. With RAUKANTEX, REHAU has been innovating its edge band solutions and bringing in scratch-resistant, heat-resistant, and attractive products. The Indian market has seen the zero-joint edge band from REHAU, which has a pre-applied polymer making the joints invisible and seamless. We also offer a wide range of Edge bands, modern surfaces, laminates, floorings and ceiling solutions in interiors, and fully fabricated custom-made components for millwork, cabinetry, etc. Our roller-shutter claims to save 30 per cent of space in the kitchen, becoming the first choice for apartment dwellers. To reach the end customer with offerings across the value chain, REHAU is now foraying into the Premium Kitchen segment with

REHAU Kitchen. The industrial solution part of REHAU includes 3rd rail solutions and commercial refrigeration in India. As a part of our building solutions, we have high-end plumbing & drainage solution and radiant heating and cooling solution used in housing, commercial buildings and infrastructure. REHAU's radiant heating cooling solution helps the consumer save at least 30 per cent of electricity and reduces the electricity consumption by 35 per cent. REHAU also provides wastewater management solutions for specialised projects.

Meanwhile, what are the relevant strategies of REHAU in terms of penetrating deeper into the Indian market? Also, it is difficult to survive with a rigid distribution model. What are the multiple models adopted by the company to ensure maximum market dissemination?

We are a solution provider for various industries, from construction to automotive. With manufacturing units, commercial sales offices, warehouses and experience centres spread across the country, REHAU has constantly been looking to augment its presence in the region, ensuring the production of goods for the Indian market while catering to exports. With more than 400 dealers and over 2500 points of sales, we



are already present in all major cities and looking to appoint franchisees across the country to give shape to our broader expansion plans.

As an experienced brand in the industry, we believe India is a very diverse market wherein it is difficult to survive with a rigid distribution model; that is why we have adopted multiple models to ensure maximum market dissemination.

Being a B2B & B2C business, we cater to the extensive demand of our customers through OEMs and dealers for an organised market. The unorganised market is being touched by catering to the local carpenters. We have separate teams for OEMs & retail networks. The teamwork closely in expanding our reach. With an extensively growing product portfolio, we are expanding our distribution network, wherein the focus is on retail counters in tier-I and III cities.

Like every other industry, polymer-based solutions have also experienced challenges in pandemic times. How have you managed to overcome these, and going forward, are you future ready for such a situation?

The polymer industry has experienced severe challenges during the

pandemic times. Starting from raw material costs being impacted across the globe to disrupted last mile operations, we have all learnt from our experiences in the process. However, as industries emerge stronger from these in the post-pandemic, new normal times, there will be renewed demands from customers in the form of better quality from the discerning ones to more efficient operations with even higher cost competitiveness as a given expectation. Manufacturers are now well aware of the impending risks that may arise in the future, and post 3rd wave, companies and the Government seem well-equipped to deal with the circumstances. Businesses around the globe are going digital; employers have understood the importance of the Work from Home culture.

Additionally, higher indigenisation is also on the cards for several industries supporting the “Make in India” drive. So, let’s evaluate the current circumstances. We can see that the human race is capable enough to fight a crisis and adapt itself to a changing world very quickly and seamlessly. While there is expected to be enough demand, with newer players entering the market, there will always be pressure on the established

ones to continue to raise the benchmark! REHAU has projects and collaborations lined up this year, making our ground stronger than ever.

Tell us about your industrial solution and how REHAU’s venture into India’s third rail metro system has turned out to be its biggest strength in the industrial solution segment?

REHAU is a manufacturer and supplier of the third rail system to the Indian metro authorities. The Ministry of Urban Development has set up two million populations as the basis for any city to become eligible for a metro rail project investment. In most metro rail systems, the power to the train is supplied by the third rail system. The third rail metro rail system in Kolkata uses REHAU third rail system. This is our biggest strength in the industrial solution segment. For REHAU, Make in India has been part of the strategy for the region, and we will continue on the same. Our current focus is to expand our Third Rail business, catering to the various Metro Projects upcoming across several cities in the country. We are proud to be bringing German technology to serve the citizens of our country. 📍

De-cluttering Biodegradable Plastics

Plastic pollution has been a major concern for every country in the world. Read to know how degrading plastic works, what having biodegradable plastic means and how the change to a cleaner environment can start.

By SK Ray, Hon. Secretary & Member Executive Committee, Indian Center for Plastics in the Environment



The recently concluded United Nations Environment Assembly (UNEA 5.2) has thrown the spotlight on plastic pollution. Nearly 200 participating countries agreed to explore the possibility of drafting a legally binding agreement by 2024 to end plastic pollution. Plastic pollution has adversely affected flora and fauna, bringing in a sense of urgency amongst policymakers and regulators to bring it under control. All efforts so far have not delivered any tangible results on the ground. As plastic waste keeps mounting, the clamour seeking probable solutions becomes louder. The issue is complex and defies a simple answer. One of the prognoses is promoting the use

of biodegradable plastics. This could, in theory, prevent further accumulation of waste in the environment. Products made from biodegradable plastics would presumably degrade and assimilate in nature. Sounds good, but this prognosis deserves a closer and critical look.

The popularity that brought trouble

Traditional plastics are used for their many features and advantages. One of them is durability. Scientists have toiled to make plastics withstand oxidative, thermal, hydrolytic and photonic stresses encountered during processing and use. Polymer structure and additives have made plastics withstand these stresses. Durability,

which made plastics popular, has now come to haunt them.

Notwithstanding the majoritarian perception that traditional plastics are virtually indestructible, evidence suggests otherwise. In the marine environment, a typical nylon rope was found to degrade at the rate of 1 per cent per month. This takes the lifetime of nylon fishing rope between 8-9 years. Similarly, the life of many traditional plastics in the marine environment was found to be 50 years on average. High, but nowhere near the “thousands of years” reported in media and various articles. Do these become later become micro or nano plastics? No clear evidence of this either. Even if it does, would these be harmful to life? The

jury is still out on this last question. Largescale use of plastics goes back only 50-70 years in the past.

The hurdle in plastic degradation

The degradation of plastics starts with photodegradation resulting in fragmentation and loss of properties. It may then undergo thermo-oxidative degradation, hydrolytic degradation and finally, maybe biodegradation. Our understanding of this process is still evolving. The rate of degradation varies with polymer types, structure, and level of additives. Plastics belonging to the polyester and polyamide families are more amenable to degradation than polyolefins. Similarly, amorphous regions show a faster rate of degradation as compared to crystalline zones. These variabilities may open up opportunities to optimise functionality and durability in traditional plastics.

There is a common perception that anything derived from nature is benign and degradable. Understanding, based on science, does not support this. For an organic matter to

PLASTICS DERIVED FROM RENEWABLE SOURCES ARE TERMED BIOPLASTICS. PLASTICS THAT ARE SUPPOSED TO DEGRADE IN THE NATURAL SURROUNDING ARE BIODEGRADABLE.

degrade, the surrounding environment should offer a combination of appropriate temperature, moisture level and microorganisms that can break down the product. Landfill sites or open dumps are not facilitative of this process. If we toss out a product made even from so-called biodegradable plastics, it will only add to our litter and not solve the problem. There is also considerable haziness surrounding biopolymers, bioplastics, biodegradable plastics and compostable plastics. Most commercially available biodegradable plastics are, in the true sense, compostable plastics that need industrial composting facilities to degrade.

Plastics derived from renewable sources are termed bioplastics. Plastics that are supposed to degrade in the natural surrounding are bio-

degradable. Between these two are compostable plastics that degrade in industrial composting facilities. It is not necessary that bioplastics would also be biodegradable plastics. We have both national and international standards to define biodegradable and compostable plastics. Biopolymer has a much wider connotation, including bioplastics but not necessarily confined to these. Most traditional plastics are non-biodegradable in the stricter sense of the term. We also have bioplastics (derived from renewable sources) that are non-biodegradable.

A classic example is Polyethylene (PE), produced through the bio-ethanol route. We also have non-renewable fossil-fuel based plastics that are compostable. An illustrative example of non-biodegradable plastic, Polyethylene (PE) and Polyethylene Tere-

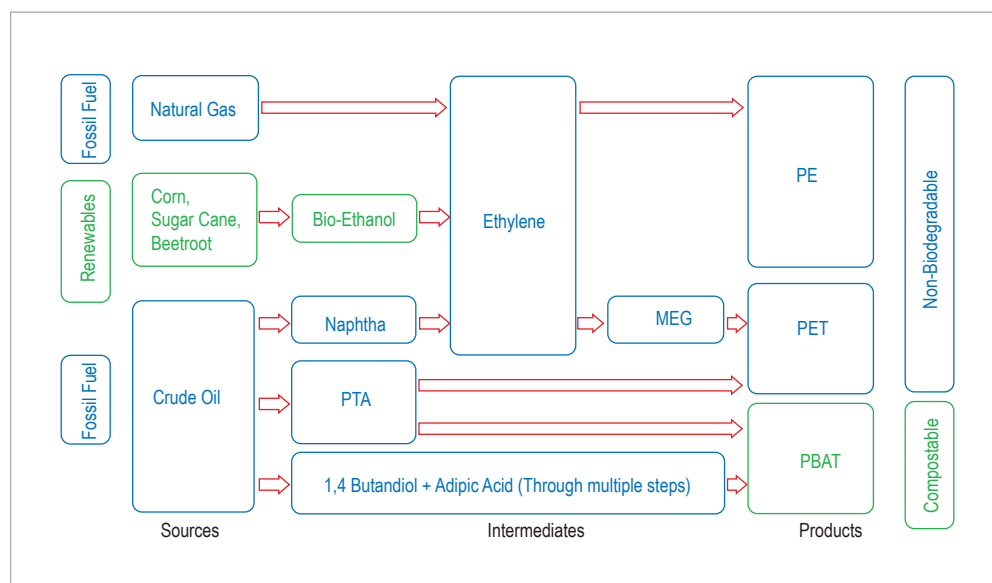


Fig 1: Illustrative examples of Polyethylene (PE), Polyethylene Terephthalate (PET) & Polybutylene Adipate Terephthalate (PBAT)



BIODEGRADABLE OR COMPOSTABLE PLASTIC WASTE CAN DESTROY THE VALUE OF TRADITIONAL PLASTICS WASTE MEANT FOR RECYCLING WHEN IT GETS INADVERTENTLY MIXED WITH THE WASTE OF CONVENTIONAL PLASTICS THAT ARE RECYCLED ABLE.

phthalate (PET), from biosources and compostable plastic Polybutylene Adipate Terephthalate (PABT) from traditional sources, is presented in Fig.1

Nearly all plastics can theoretically be made from naturally occurring feedstock. That is how some of the plastics we are familiar with today were initially produced. The first PE plant in India was based on bioethanol, derived from molasses, a waste product of sugar production. In India, a commercially operating Mono Ethylene Glycol (MEG) plant is based on bioethanol. Brazil has large production capacities of PE based on bioethanol. However, at the prevailing stage of technology, the production cost of most of these traditional plastics is too prohibitive to make them commercially viable. Molasses-based production of bioethanol also leaves very high wa-

ter and environmental footprints as growing sugar cane puts huge pressure on land and water.

Creating “biodegradable” plastics

Renewable feedstocks do have potential environmental benefits. We move away from non-renewables to renewables. However, it needs to avoid conflict with our food system. This makes agricultural waste a good alternative. Although in its infancy, cellulosic ethanol can be an economically viable source of ethylene, the largest building block for plastics. The limiting factor today is the very low yield. A parting comment on Biopolymers. All intermediates shown in Fig.1 can be obtained from biosources. The challenges are cost and scale. This is unlikely to change in the near future and could be a major bottleneck.

All biodegradable and compostable plastics commercially available today face three major challenges – functionality, scale and cost. Products made from truly biodegradable plastics (mostly starch derivatives) are way off in their performance compared to traditional plastics. This not only limits their uses but also magnifies the cost disadvantage. An additional downside is the concern of contamination. Biodegradable or compostable plastic waste can destroy the value of traditional plastics waste meant for recycling when it gets inadvertently mixed with the waste of conventional plastics that are recycled able. And, in the waste streams, it is hard to keep them apart.

Starting with a change in human habits

Does this close the door for biodegradable plastics in future? Not really. Science will come up with solutions to improve the performance of biodegradable plastics. Improved production technology and higher economy of scale would also beat down current cost disadvantages. The most challenging part would be changes needed in human behaviour to reduce, if not eliminate, littering. This would need to be complemented with infrastructure to manage waste separately. Does this sound familiar? Yes, it is the same solution to manage waste from conventional plastics. Biodegradable and compostable plastics have a role to play where the economic and environmental cost of collection, segregation and recycling of traditional plastics is prohibitive. A few obvious examples are mulch films in highly mechanised agricultural setups or colour-coded trash bags for wet waste, which are meant to move through separate waste management streams. Indiscriminate promotion of biodegradable and compostable plastics could cause more harm than good to our environment. ♻️

Polymer Pipes Market In India

The article offers an elaborated view of India's plastics and polymers market, global trends, government support, challenges, and outlook.

By Siddharth Bansal, Director, Skipper Pipes

Polymer pipes are essentially plastic pipes, and they have been around since the early 20th century. However, around the mid-20th century, say post-1950s, polymer pipes underwent stronger development due to technological advancements and innovations in pipe fittings and technologies. Ever since polymer pipes have entered the global market, it has gradually transformed how our plumbing system is designed.

Polymer pipes quickly replaced metal pipes as they were more affordable and corrosion-resistant. Today, polymer pipes are used for numerous purposes in a host of industries, which includes facilitating water supply to homes, irrigation, vacuum and pressure systems, drainage and sewage systems, manufacture of advanced fire-sprinkler systems, infrastructure for the conveyance of chemicals, heating and cooling fluids, food products, and of many forms of gaseous or liquid fluids.

Although polymer pipes are most commonly known due to polyvinyl chloride (PVC) pipes, other forms of plastic pipes are available for specific purposes. For instance, acrylonitrile butadiene styrene polymer pipes conveyance for chemicals and slurries; polybutylene or PB-1 is used in pressure piping systems for hot and cold water pressure; and so on.

Global and local polymer pipes market

In the new normal India, the polymer pipes sector has been doing rather good, despite the pandemic impact. A significant shift has happened in demand for the metal to



polymer pipes in various sectors, including plumbing and piping application in the construction industry. CPVC pipes are increasingly being used for hot and cold-water plumbing, and the sector has witnessed strong growth in the usage of these pipes.

The major players in the industry, who have the highest market capitalisation, have reported a year-on-year 3 to 11 per cent CAGR growth in the past two years. As per CRISIL, the PVC pipes makers are projected to make a record 35 per cent surge in FY2022. Globally, the pandemic has impacted the market

of plastic pipes, which is estimated to be \$29.9 billion in 2022. However, considering market corrections due to the pandemic means the sector would grow at a CAGR of 5.6 per cent by 2026, achieving a size of \$38.1 billion.

In India, the plastic pipes industry is around Rs 400 billion. In the past five years, through the pandemic, it has scripted a 10 per cent CAGR from FY2016 to FY2021. The sector is projected to record a slightly higher growth rate of 12 per cent and achieve Rs 550-600 billion by FY 2025. The organised players in the sector account for approxi-

mately 67 per cent of the market in FY 2021.

The government impetus

Our country is amongst the biggest consumers of CPVC pipes and fittings products. Furthermore, under the visionary leadership of Prime Minister Narendra Modi, the government has initiated “Har Ghar Jal Yojna” and “Jal Jeevan Mission”, intending to make tap water accessible to all rural households in India. One of the most significant steps taken by the government is the Jal Jeevan Mission (JJM) initiative, which aims at providing tap water connections to all rural households by 2024.

With the growing need for clean water in all residential and commercial projects, the plumbing pipes and fitting product segment will witness stronger demand and growth. This has strongly pushed the demand for PVC pipes and fittings to support water flow in each home. The PVC and Fittings market was estimated to be around Rs 300 billion in FY2020. With a CAGR of 10.8%, the sector could surpass Rs 500 billion by FY2025.

Indirect growth accelerators

Pursuing the mission of Atmanirbhar Bharat, the Government policies are directed toward national development, which has self-reliance at its core. The government's support of the sector will play an instrumental role in its growth. While direct policies amplify the sector's development, several indirect policies create growth avenues. The government has levied Anti-Dumping Duty on CPVC resin/compound imports from China and Korea from 2020 to 2025. This move is benefiting the local players directly.

The government has strongly focussed on designing various institutional structures. It has boosted the efforts to monetise assets to



OVER A PERIOD OF TIME, TECHNOLOGICAL ADVANCEMENTS HAVE MADE AVAILABLE SUPERIOR ALTERNATIVES TO LITHIUM AS AN MFG THICKENER MATERIAL, THE MOST PROMISING BEING CALCIUM SULFONATE. HOWEVER

achieve the National Infrastructure Pipeline (NIP) goals. Consequently, it has allocated capital expenditure of 5.5 trillion for FY2022. Several Government initiatives, which may not be directly related to the polymer pipes segment, are contributing to the sectoral growth in a big way. The Nation Monetization Pipeline is focused on strengthening infrastructure in urban India.

There is a growing focus on rural infrastructure development, which is creating newer markets for polymer pipes. The expansion of railways, airports, roadways and highways, and the agricultural sector is creating demand for polymer pipes in India. Another big growth accelerator focuses on reviving the affordable housing sector and urban planning. Other sectors adding to the demand include automotive, electrical and other end-use industries, oil and gas, and petrochemicals. The develop-

mental focus of the Indian government has therefore presented the sector with a growth roadmap and numerous opportunities.

Challenges, opportunities, and trends

The polymer pipes market is not without its challenges. However, challenges provide opportunities for innovation, which further leads to trends. The following are some of the macroscopic challenges, opportunities and likely trends which can impact the sector.

Global uncertainties. The world is facing several global uncertainties, including threats of climate change. For the past two years, the more urgent crisis has been the pandemic which has ravaged economies in waves. In India, post the third wave, the economy is at a full upswing. However, it is still premature to



rule out a future wave that can affect value and supply chain, lead to container shortages, inflate the cost of crude oil, and affect international trade. The polymer pipes sector in FY2021 witnessed a strong rise in PVC prices due to these constraints and high demand for the product, and increased shortages. While this is unlikely to repeat, international geopolitics and conflicts have further disrupted industry, trade, and economies worldwide. Although the Indian polymer sector is largely protected, it may have some impact in the time to come. Any inflation in manufacturing costs will eventually get passed on to the customer.

Mixed imports and sourcing of raw materials

India sources key raw materials for the polymer market from various countries. The majority of the raw materials are connected with the state of crude oil in the International market. While domestic petrochemical companies provide a significant

share of raw materials to the industry, most products are sourced from countries like UAE, Saudi Arabia, Qatar, Korea, Taiwan, Japan, China and Europe. As we advance, India has a tremendous opportunity to create avenues for manufacturing raw materials in the country. Localisation will be a significant trend going forward. We need to rethink our dependency on imports from other countries, considering volatile geopolitical and economic situations for it to happen.


Industry consolidation: The polymer pipes sector is fragmented, with the lesser-known and smaller players sharing a significant part of the market. However, the players have a low propensity to endure, adapt, and upgrade against various uncertainties. This has led to some consolidation in the sector.

Lower usage of lead: There is a growing focus on minimising or abating lead usage for manufacturing polymer pipes. PVC pipes are the most common sources of lead contamination in drinking water supplied to the home.

Consequently, the government has mandated a BIS license from March 2022 (extended deadline) to control the quality of pipes and contain lead usage in the industry. It will further declutter the sector and will lead to higher consolidation. This is because smaller players would have to upgrade machinery, and product quality, apply for and purchase licenses, and incur other capital expenditures, which will increase the cost of production drastically.

Use of Calcium and Zinc: The industry will also switch to an increased usage of calcium and zinc instead of lead, reducing the efficiency of older machines by 15 to 20%. This will further require the players to upgrade their plant and machinery in the short term. The bigger players will continue to consolidate and gain market share, while the smaller players will need Government support and incentives to stay in the competition.

The polymer pipes industry has strong growth drivers in various development sectors, including building and construction, automotive, oil and gas, urban and rural planning, etc. The industry has witnessed constant growth in the near past. By FY2018-2019, the Pipes Industry had achieved an estimated value of Rs 300 billion. Its sub-segments, fittings have over 20 per cent margins, followed by CPVC with 16-18 per cent and PVC plumbing range with 12-13 per cent.

With a 73 per cent share of the market, the PVC pipes and fittings segment is expected to grow during FY 2019-2026. It is anticipated that the sector will record a double-digit CAGR growth of 14 per cent by revenue. While the sector continues to become cleaner and greener in its design of products and addressing customers' needs, the industry will continue to consolidate, and organised players will gain a stronger market share. 

Igus Trapezoidal Thread Achieves 82 Per Cent Efficiency

Trapezoidal threads have been mechanical engineering classics for decades. Motion plastics specialists rely on optimised interaction between the metal lead screw and the plastic lead screw nut geometries.

At igus, the nut's thread flanks are larger than those of classic trapezoidal threads, as is the width of the lead screw. This is a small change, but it has significant consequences: enlarging the thread flank results in more high-performance plastic used for power transmission. This means more tribologically optimised material, i.e., regarding friction and wear. "The asymmetry has enabled us to extend the service life so that it is about 30 per cent longer than that of symmetrical trapezoidal threads," said Thorben Hendricks, Head of



the dry spin Lead Screw Drive Business Unit at igus. "Optimising the flank angle also increases the amount of energy supplied that can be used. We have flattened the flank angles of the lead screw nut and lead screw. This gives us above-average efficiency –

up to 82 per cent at high pitches," he added.

The new dryspin thread technology is durable, efficient and quieter than many conventional trapezoidal threads. This is because the tooth flanks are not angular but rounded, reducing the contact area between the lead screw nut and lead screw. This leads to less vibration, which can take the form of rattling or squeaking. Hendricks remarked, "The rounded tooth flanks allow the lead screws to move almost silently

without vibration. The lead screw manufacturing tolerance is tighter than specified in DIN 103 7e, ensuring more precise operating behaviour, allowing for much higher speed in the application."

igus began establishing its lead screw technology on the market in 2013, initially as an alternative to high helix threads. Now there are eight new installation sizes - harmonised lead screws and lead screw nuts, including dimensions with low pitches that enable quick one-to-one replacement of installed trapezoidal threads. The new lead screws are available with pitches of 6.35x6.35 RH, 8x40 RH, 10x3 LH, 12x25 LH, 14x4 RH, 16x5 RH, 18x4 RH and 20x10 RH. The lead screws are made of stainless steel or aluminium; the lead screw nut material can be selected from seven high-performance plastics and several geometries - from a cylindrical design with flange or spanner flats to a version with spring pre-load.

Waters Introduces Solution For Mass And Purity Analysis Of Biomolecules

Waters Corporation introduced new software and analytical columns to aid biomolecule drug discovery and development. The new Waters™ Intact Mass app on waters_connect™ allows scientists using the BioAccord™ LC-MS System to confirm the mass of biomolecules and impurities made by synthetic or recombinant processes nearly twice as fast as other commercially available options.

Intact mass analysis is routinely performed during all stages of the development of biological drugs, including proteins, peptides, oligonucleotide therapies and conjugates. In the early stages of drug discovery, biochemists must analyse hundreds or even thousands of samples per week. To help speed this process, the Waters Intact Mass app provides a fast, reliable, and automated solution to facilitate mass confirmation and pu-

rity determination of novel biotherapeutics. The application features intelligent automated deconvolution to process sample results within minutes of capture, with minimal user input.

Introducing Waters MaxPeak Premier Protein BEH C4 300Å Columns for Intact & Subunit Protein Analyses.

Complementing the introduction of the Intact Mass app is a new line of analytical columns that are essential for analysing intact biomolecules and their subunits. The ACQUITY™ Premier and XBridge™ Premier Protein BEH C4 300Å Columns for the BioAccord LC-MS System feature MaxPeak High-Performance Surfaces



(HPS) technology that prevents the loss of sample analytes due to adsorption of phosphorylated and carboxylated molecules between the sample and metal surfaces of both the LC system and column. This enables up to 3X greater sensitivity for

low-level intact mass analysis and 2X greater sensitivity for the intact mass analysis of phosphorylated proteins and low-level subunits of monoclonal antibodies.

The Intact Mass App on waters_connect is available for new BioAccord LC-MS Systems and as an upgrade to previously installed systems. MaxPeak Premier Protein BEH C4 300Å Columns are now available from Waters worldwide.

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