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Vol. 23 No. 04

April 2024

Registered-RNI No. MAHENG/2002/7908

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**Kastwel Foundries
Celebrates Golden
Jubilee**

Subodh Panchal
Managing Partner,
Kastwel Foundries,
Past President
of The Institute of
Indian Foundrymen



■ **Vedanta Aluminium
Advances Renewable
Shift with Biomass Power**

■ **Overview of Digitalization
in Mining, Metals &
Material Industry**

■ **FOUNDRY 4.0
DIGITALIZATION IN
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D. A. Chandekar
Editor

Dear Readers,

I have always been making a point through this column that the India's economic growth is backed by the infrastructure development and the metallurgical industry is in the center of the infrastructure development process. Thus if India's economy (meaning GDP) has to grow for the next few years, it needs a strong support from metals industry. This thought process makes us confident about the future of the metals industry in the country. Yes, this industry in India has a bright future on a long term basis but this does not by any chance means that it is free of all the problems. Rather I would say, it has to overcome many hurdles, tackle many issues so as to ensure a smooth upward journey.

What are the issues presently facing the industry ? I can say that the first and foremost issue is that India does not have enough plant designing and building capacity. How many companies are there in the country which can design and build a integrated metal producing plant ? I would say only a handful of them. The second issue in the priority list is lack of technically qualified manpower. Are we aware that very few engineering colleges in India offer metallurgy stream and very few metallurgists remain in metallurgical profession after passing out. They are 'snatched away' by the industries offering better packages and better work

Editorial Desk



environment. Seeing all this, many engineering colleges have either stopped offering metallurgy stream or integrated it in the Material Science stream. What are we as an industry doing about it ? Why metals industry, in spite of being a core and very important industry for the economic growth of the country, can not look into such basic and fundamental issues which will surely help the industry and also the economy in the long run ?

Now let us discuss about the international situation. We know that the Eurozone is stagnated for the last few years and India's metals product exports to this region have decreased over the years. Also the Russia – Ukraine war as well as the proposed CBAM post 2026 has further deteriorated the situation and thus I don't see much growth in India's exports to Eurozone. MENA region was another big export destination for us but given the fluid and war like situation in many countries in the region, it may not be advisable to depend on this region for the exports. For SE Asian countries, we have a big competitor like China and Africa is yet to awake fully.

Given such a situation in the global marketplace, in my opinion the best strategy is to look inward. India is the biggest emerging market in the world. The whole world is looking for the opportunity to enter the growing Indian markets. Further, our rural markets have tremendous untapped potential. Instead of swinging up and down with the uncertain international geopolitical situation, concentrate here. Develop products suitable and useful for rural life. There lies the future !

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Kastwel Foundries Celebrates Golden Jubilee

Subodh Panchal

Managing Partner, Kastwel Foundries, Past President of The Institute of Indian Foundrymen



Subodh Panchal has been the Managing Partner of Kastwel Foundries since 1974, boasting a rich history of leadership. His tenure as the Past President of The Institute of Indian Foundrymen reflects his profound influence in the industry. Additionally, his role as an Executive Council Member of prestigious organizations such as the World Foundry Organization, China Foundry Association, BRICS, and Asia Foundry Forum underscores his global reach and impact.

Subodh Panchal's efforts have extended beyond domestic borders, as he has spearheaded the participation of the Indian foundry industry in renowned international events such as GIFA and Hannover, Germany, Ankiros in Turkey, Metal China, and International Foundry Congresses in various countries including the UK, Korea, and Poland. Under his leadership, numerous Indian Foundry Congresses have been organized, marked by innovative and creative programming that has elevated the stature of IFEX exhibitions to new heights. Mr. Panchal's strategic networking efforts have resulted in valuable international collaborations for the IIF, including securing complimentary stands for Indian foundries at Hannover through CBI Netherlands.

D A Chandekar, Editor & CEO of Metalworld had an exclusive interaction with Mr. Subodh Panchal to understand more about the, current economic scenario of the Foundry sector, journey and future plans of Kastwel Foundries, on his recent Foundry delegation to Vietnam , etc.

1) How is Foundry sector placed in the current economic scenario and what are the Future prospects ?

The current scenario in the Indian Foundry industry is

very promising, largely fuelled by ambitious infrastructure development initiatives spearheaded by the government. This robust expansion agenda has

catalyzed heightened activity across various sectors reliant on castings, including automotive, agricultural machinery, engineering, railways, and wind power.

With these key user industries experiencing a surge in demand, the foundry sector is compelled to scale up its capacities to effectively address the growing needs of its clientele. This entails investments in advanced technologies, expanded production facilities, and enhanced operational efficiency to ensure timely and sufficient supply of castings to meet the burgeoning demand.

2) Kastwel Foundries has completed 50 years of service to Foundry sector. What are the important milestones in this long journey ?

Kastwel Foundries embarked on a pioneering journey in 1974 by introducing the manufacturing of Nickel Magnesium and Copper Magnesium alloys. These alloys gained initial approval after undergoing rigorous trials

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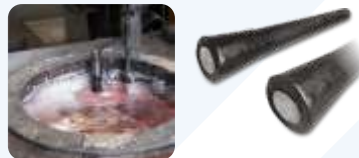
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Face to Face

at Premier Automobiles Foundry in Wadala, Bombay. This period coincided with a significant phase in the foundry industry, characterized by SG Iron

manufacturing 8-10% and 5-7% Mg grades, incorporating various elements such as calcium, rare earth metals, lanthanum, and others, in line with international standards.



foundries exploring Ferro Silicon Magnesium alloys as a means of cost reduction, particularly as nickel was not deemed necessary in all grades of SG Iron.

In 1975, Kastwel further expanded its product portfolio by commencing the production of Ferro Silicon Magnesium with 30% Mg content, previously imported mainly from Germany. This grade found applications in prominent organizations such as Southern Alloys in Chennai, Burn Standards in Howrah, BHEL in Hyderabad, and several others. Over time, as industry knowledge evolved, the principle that "Lower the Magnesium, Higher the recovery" gained prominence. Kastwel adeptly responded to industry demands by

Throughout its five-decade journey, Kastwel Foundries has been synonymous with providing cutting-edge technological and commercial solutions to SG Iron foundries. The trust in Kastwel's products stems from their unwavering commitment to consistency in performance and delivering cost benefits to their clientele.

In addition to Ferro Silicon Magnesium alloys, Kastwel also offers a diverse range of products including inoculants, carburizers, aluminium grain refiners, and other essential foundry supplies, further solidifying its position as a comprehensive solution provider in the foundry industry.

Dr Ing PN Bhagwati

(Chairman - Bhagwati Group of Companies, Past President – WFO and The IIF) said "To my utter surprise, I got FeSiMg Alloys from Kastwel which I still using in my cos because of consistent quality of international standards, better recovery and uninterrupted supply during last 50 years"

3) What are the future plans of Kastwel Foundries ?

Kastwel Foundries is gearing up to meet the escalating demand from SG Iron foundries by doubling the capacity of its Ferro Silicon Magnesium (FeSiMg) alloys production. This strategic move reflects Kastwel's proactive stance in aligning its capabilities with the growing needs of the industry.

As part of its expansion plans, Kastwel is not only increasing its capacity for FeSiMg alloys but also diversifying its product offerings to include foundry grades cored wire and other master alloys. Foundry grades cored wire is a crucial component in the foundry process, utilized for precise and controlled addition of alloying elements during metal casting. By venturing into the production of cored wire and master alloys, Kastwel aims to provide comprehensive solutions to SG Iron foundries, catering to their evolving requirements for enhanced efficiency and performance.

This expansion initiative underscores Kastwel's commitment to staying ahead of market dynamics and equipping itself to better serve its customers. By bolstering its production capabilities and



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Face to Face

broadening its product portfolio, Kastwel is poised to further solidify its position as a trusted partner and solution provider in the foundry industry.

4) Tell us about your recent Foundry delegation to Vietnam ?

The delegation led by you to visit three foundries in Vietnam was a comprehensive and enriching experience for all involved. The support of the Vietnam Foundry Association ensured smooth coordination and access to these prominent foundries, providing valuable insights into their operations and methodologies.

DISOCO, with its establishment dating back to 1980, impressed the delegation with its substantial workforce of 850 employees and impressive annual turnover of 30 million USD. The foundry specializes in producing a wide range of products including automobile components, motorbikes, and engine parts. Noteworthy was their utilization of advanced processes such as Green sand, SINTO, and Lost Foam (LFC), with a commendable capacity of 2800 metric tons per year.

FUTU 1, accredited with ISO 9001-2015 certification, showcased its expertise in manufacturing diverse products ranging from auto parts and fork lifts to precision components and engine flanges. The delegation observed their

commitment to quality and precision across various product lines, highlighting their versatility and adaptability in meeting industry demands.

VICO, established in 1998, stood out for its modern production facilities featuring DISA automatic and Alphabet molding lines, as well as Lost Foam technology. With a substantial capacity of 20,000 metric tons per year, VICO specializes in producing a wide array of products including high chrome grinding balls, high chrome cast iron, high manganese steel, carbon steel, and ductile iron. Their emphasis on utilizing advanced technologies and materials underscored their commitment to innovation and quality.

The delegation's itinerary, combining foundry visits with sightseeing activities, provided a balanced and budget-friendly experience. Participants expressed their satisfaction with the tour,



highlighting the unique opportunity to witness firsthand the working styles, discipline, and innovative practices of the visited foundries. The warm and friendly welcome extended by all three foundries further enhanced the overall experience, fostering fruitful exchanges and networking opportunities.



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Feature



Vedanta Aluminium Advances Renewable Shift with Biomass Power

Vedanta Aluminium, India's largest producer of aluminium, is making its fuel mix more sustainable with the deployment of biomass briquettes for power generation. The company is now utilizing 20 tonnes of biomass briquettes per day at its world-class alumina refinery in Lanjigarh, Odisha. This will help potentially decrease the unit's greenhouse gas (GHG) emissions by more than 10,000 tonnes of CO₂ equivalent each year, in addition to reducing its reliance on fossil fuels. On the occasion of Earth Day 2024, this comes as a significant step forward in the company's journey to achieve Net Zero Carbon by

2050 or sooner.

The biomass briquettes are made from agricultural residue sourced from local farmers, who would otherwise simply burn it leading to severe environmental pollution. While fostering circular economy, Vedanta Aluminium is also augmenting farmers' incomes in their areas of operations through this initiative by remunerating farmers for their crop stubble. A similar initiative has been rolled out previously at BALCO, India's iconic aluminium producer and a unit of Vedanta Aluminium based at Korba, Chhattisgarh. Further, the company has entered into



long-term power delivery agreements to source 1335 MW of renewable energy to power its operations nationwide.

Speaking on the occasion, Mr. Pranab Kumar Bhattacharyya, CEO - Alumina Business, Vedanta Ltd said, "As India works towards integrating cleaner and more sustainable energy systems, the strategic deployment of biomass co-firing within our operations can play a crucial role in achieving emission reduction goals and supporting rural economies. It forms a critical part of our strategy to evaluate emerging technologies towards decarbonising our operations."

On the occasion of Earth Day, the company organised



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Feature

focused awareness sessions for farmers at Jharsuguda, Odisha, under the aegis of its development

Aluminium has committed to decarbonizing 100% of its Light Motor Vehicle (LMV) fleet by 2030, aligned with



project, Jeevika Samridhi, which aims to boost income generation through more efficient methods of farming. The sessions offered insights into the preparation and usage of organic fertilisers for integrated nutrient and pest management. In addition, the company also organised a Waste to Wealth-themed model competition for children. It was an opportunity for the future stewards of the planet to showcase their innovative use of recyclable materials, such as old cloth, plastic utensils, cardboard pieces and even coconut shells. The company has also conducted trial runs of bio diesel as a 'green' fuel alternative for its fleet of commercial vehicles. In addition, it is the first to induct a 10-ton electric forklift within its operations, adding to India's largest fleet of electric lithium-ion forklifts deployed at its plants in Odisha and Chhattisgarh. Vedanta

the United Nations Sustainable Development Goal 7 (SDG7), which focusses on ensuring access to affordable, reliable, sustainable, and modern energy and SDG 13, which aims to limit and adapt to climate change.

Vedanta Aluminium has committed to achieving Net Zero by 2050, adopting a two-fold strategy of reducing its carbon footprint by increasing operational excellence and increasing renewables in its energy mix, while also offsetting its carbon footprint through extensive afforestation efforts. Through its operations, the company is enabling wider global access to responsibly produced, high-quality aluminium to ensure a greener future for the planet. The key milestones achieved by the company in this journey are:

- Reducing GHG emissions intensity by ~8% in FY23 over the

FY21 baseline while increasing production by ~16%

- Recycling over 15 billion litres of water across its operations during FY24
- Achieving a noteworthy 11% reduction in water withdrawal from freshwater sources
- Significant freshwater usage savings of 1.5 million cubic meters
- Doubling waste utilization to 200% in FY23, boosting circular economy avenues
- Collaborating on over 60 rural community water bodies restoration projects

Vedanta Aluminium, a business of Vedanta Limited, is India's largest producer of aluminium, manufacturing more than half of India's aluminium i.e., 2.37 million tonnes in FY24. It is a leader in value-added aluminium products that find critical applications in core industries. Vedanta Aluminium ranks 1st in the S&P Global Corporate Sustainability Assessment 2023 world rankings for the aluminium industry, a reflection of its leading sustainable development practices. With its world-class aluminium smelters, alumina refinery and

power plants in India, the company fulfils its mission of spurring emerging applications of aluminium as the 'Metal of the Future' for a greener tomorrow. ■





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Overview of Digitalization in Mining, Metals & Material Industry

Advances in connectivity and lowering cost of sensors, measurement, data collection/storage/analytics, and computation, have all together, offered many opportunities to business. Automation of jobs, roles and functions, and predictive ability that they collectively offer, has brought a disruptive change in everything, from household, to commerce & trade to manufacturing to supply chain. Classical Mining & metallurgy have generally been a reluctant adapter of new technologies, peripheral to their core processes. The nature of mining, metals and materials business has however realized how many of the problems that this industry has faced can be effectively addresses for good, using these new technologies. It is the purpose of this article to provide an overview of digitalization in mining, metals, and material industry.

What was the general way of working prior to the advent of digitalization?

Before digitalization became widespread, many industries relied heavily on manual processes, paper-based documentation, and analog technologies. Here are some common practices in various industries before the advent of digitalization:

1. Paper-based documentation: Businesses maintained extensive records, documents, and files in physical form, often stored in filing cabinets or archives. This included invoices, contracts,



customer records, and more. The contents were hardly ever subjected to classical statistical analysis, and were treated as volatile.

2. Analog communication:

Communication between individuals and organizations primarily occurred through hard copies, mail, and face-to-face interactions. Measurement of most process parameters was instant value or as a grace of the property measured and plotted.

3. Manual data entry and processing:

Data entry tasks were performed manually, often requiring significant time and effort. This increased the risk of errors and made data analysis and reporting slower and less efficient and often was redundant since it resulted into post-event correction, if at all. The real value of the measurement, as indicators of the process or product health was thus not utilized.

4. Manual/semi-manual manufacturing processes:



Sadguru Kulkarni

Technology Retired President - Technology, Hindalco Industries Ltd Corporate, covering Research and Technology, Technical.

Manufacturing industries relied heavily on manual labour and electrical-mechanical systems for production. Processes such as assembly, quality control, and inventory management were often labor-intensive and prone to inefficiencies.

5. Traditional marketing:

Marketing and advertising efforts were predominantly offline, relying on methods such as print ads, billboards, television commercials, and direct mail. Analyzing the effectiveness of marketing campaigns was challenging without digital tracking tools.

6. Physical transactions: All transactions, whether financial, material management, product delivery, customer care were manual or semi manual, and not real time. The corrective actions were thus sequential and often as post-mortems.

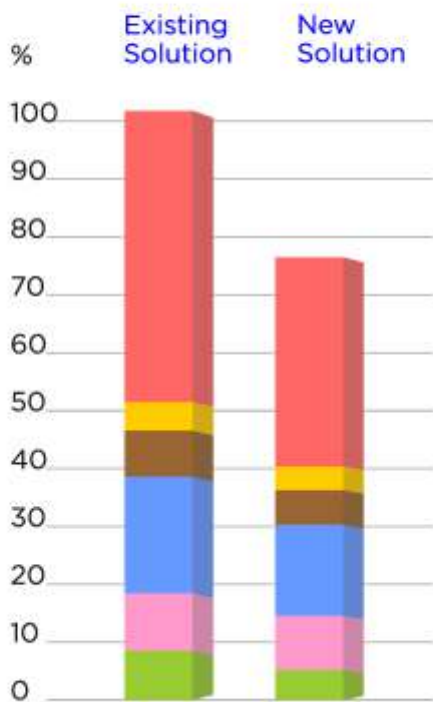
Overall, the practices before digitalization were characterized by manual labor, paper-based processes, limited connectivity, and slower information exchange. Digitalization has since

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Feature

transformed these industries by automating tasks, digitizing data and processes, improving communication and collaboration, and enabling greater efficiency and innovation.

What is digitalization:

Digitalization, (or digitization), refers to the process of converting information, data, or physical objects into a digital format. This can involve various aspects such as converting analog signals into digital signals, converting physical

phones, the internet, and software applications, to improve potential to enhance efficiency, accessibility, and functionality.

Effective use of digitalization can lead to benefits, including increased productivity, improved data analysis capabilities, enhanced communication and collaboration, and better access to information and services. It plays a significant role in the ongoing digital transformation of industries and societies worldwide. In recent years, deep learning technologies has added a



documents into electronic files, or transforming manual processes into digital work flows. Digitalization makes everything available as numbers and statistics provides tools to generate meaning and value out of numbers. Thus, digitalization often involves using digital technologies to enhance or streamline processes, operations, and services across various domains, including business, manufacturing, commercial or financial transactions, even education and control processes. It encompasses the adoption and integration of digital technologies, such as computers, smart

novel facet to compliment the offers of digitalization. The prowess of machine learning and artificial intelligence has enabled the use of data to draw meaningful correlations, learning, and controls beyond the abilities of human mind, and offer the potential to eliminate human error from manufacturing processes. All these developments are now in the process of appropriate adoption by the classical. Minerals, metals, and material industry. Tools and techniques for digitalization of Mining: Digitalization offers numerous opportunities for

the mining industry to improve efficiency, safety, and sustainability. Some key digitalization opportunities in mining include:

1. Remote Monitoring and

Control: Implementing IoT (Internet of Things) sensors and devices on mining equipment and infrastructure allows for remote monitoring of operations in real-time. This enables proactive maintenance, reduces downtime, and optimizes equipment performance.

2. Autonomous Vehicles and

Robotics: Utilizing autonomous haul trucks, drills, and other equipment can improve productivity, safety, and efficiency in mining operations. These vehicles can operate continuously without breaks, reducing the risk of accidents and increasing operational efficiency.

3. Predictive Analytics and

Maintenance: Leveraging big data analytics and machine learning algorithms can predict equipment failures before they occur. By analyzing historical data and equipment performance metrics, mining companies can schedule maintenance proactively, reducing downtime and maintenance costs.

4. Digital Twin Technology:

Creating digital twins of mining assets, such as processing plants and equipment, allows for virtual simulations and optimization of operations. Digital twins enable mining companies to test different scenarios, identify potential bottlenecks, and optimize processes for maximum efficiency.

5. Advanced Exploration

Techniques: Digitalization can enhance exploration activities through the use of remote sensing technologies, geospatial data analysis, and predictive modeling. These techniques help identify new mineral deposits more

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- Smart manufacturing equipment
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Feature

accurately and efficiently, reducing exploration costs and environmental impact.

6. Integrated Supply Chain

Management: Implementing digital platforms and block chain technology can streamline supply chain management processes in the mining industry. This includes tracking the origin and movement of raw materials, optimizing logistics, and improving transparency and accountability throughout the supply chain.

7. Environmental

Monitoring and

Management: Digitalization can improve environmental monitoring and management practices in mining operations. IoT sensors and drones can monitor air and water quality, detect environmental risks, and facilitate compliance with regulations, leading to more sustainable mining practices.

8. Workforce Training and

Safety: Virtual reality (VR) and augmented reality (AR) technologies can be used for immersive training simulations and safety awareness programs for mining personnel. These technologies help improve safety practices, reduce accidents, and enhance workforce skills and productivity.

By embracing digitalization, mining companies can optimize their operations, reduce costs, mitigate risks, and contribute to a more sustainable and efficient mining industry.

Examples of global mining companies successfully adapting digitalization in their operations can be seen from the public domain information and reports on these companies.

1. Rio Tinto: Rio Tinto is a global mining company that has been at the forefront of digitalization in the industry. The company has implemented autonomous haul trucks, drills, and trains at its mining sites to improve productivity and safety. Rio Tinto also utilizes data analytics and machine learning algorithms for predictive maintenance and optimization of operations. The use of data harvesting, and analytics to get insights in core manufacturing processes is also reported in the alumina, aluminium metal, mechanical processes such as rolling, extrusion, casting, forging is also reported. Use of model based digital twins is also reported for powerplants, reactors, electrolytic smelters etc.

2. BHP: BHP, another major player in the mining sector, has invested heavily in digital technologies to enhance its operations. The company utilizes autonomous haulage systems, drones, and remote monitoring systems to improve safety and efficiency in its mining activities. BHP also uses advanced data analytics for ore body modeling and optimization of resource extraction.

3. Vale: Vale has implemented digitalization initiatives to optimize its mining operations and improve sustainability. The company uses IoT based sensors and data analytics for real-time monitoring of equipment performance and environmental conditions. Vale also employs digital twins and simulation technologies for mine planning and optimization.

4. Anglo American: Anglo American has been actively exploring digitalization

opportunities to transform its mining operations. The company utilizes digital technologies such as autonomous drills, drones, and advanced data analytics to improve safety, productivity, and environmental performance. Anglo American also collaborates with technology partners to develop innovative solutions for sustainable mining.

5. Fortescue Metals Group:

Fortescue Metals Group, a leading iron ore producer in Australia, has embraced digitalization to enhance its mining operations. The company utilizes autonomous trucks, drills, and trains for efficient resource extraction and transportation. Fortescue also employs data analytics and AI algorithms for predictive maintenance and optimization of production processes.

6. Newmont Corporation:

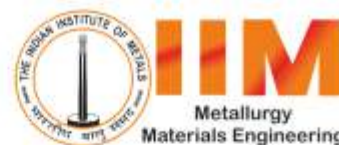
Newmont Corporation, one of the largest gold mining companies globally, has integrated digital technologies into its operations to improve performance and sustainability. The company utilizes IoT sensors, real-time monitoring systems, and advanced data analytics for predictive maintenance and optimization of mine operations. Newmont also focuses on digital innovation to drive continuous improvement in safety and environmental management.

These companies are just a few examples of how digitalization is being utilized in the mining industry to drive innovation, improve operational efficiency, and address key challenges. As digitalization continues to evolve, more mining companies are expected to adopt advanced technologies to remain competitive and sustainable in the long term.





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- * Develop a road map for Bauxite, Alumina and Aluminium industry in India.
- * Provide a platform for primary and secondary aluminium producers to share knowledge and review latest developments in the entire value chain of Aluminium Industry.
- * Application of Bauxite and Alumina in non-metallurgical industries.
- * Digitisation Process and Digital Twins.
- * Decarbonization and Green Aluminium.
- * Aluminium recycling industry.

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Conference Highlights

- * A pre-conference workshop on 3D Printing will be organized by BITS and IIM Goa Chapter.
- * Visionary leader outlines the future trajectory of the bauxite, alumina & aluminium industry.
- * The latest developments & innovations in alumina refining, aluminium smelting & aluminium downstream/recycling technologies.
- * A post conference visit to the HINDALCO Belagavi Alumina Refinery, Karnataka.

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For participation and further details, please contact the IBAAS Office, India



FOUNDRY 4.0

DIGITALIZATION IN FOUNDRY INDUSTRY

Introduction

Foundry is a manufacturing unit where molten metal is poured into a mold to form different shapes. Foundry industry is more than 5000 years old and over the period it has become a highly knowledge intensive process where only experienced personnel are able to produce the right quality castings. World over metal castings are produced in a proportion which is by far the highest compared to other materials. In metals too, Ferrous castings are almost 90% of the total production.

Foundries are equipped with equipment, machines, tools, protective gear, and devices that all make metal casting process possible. Foundry workers operate equipment with a vast understanding and knowledge of the tools and materials used.

The foundry industry is undergoing a significant transformation, thanks to the advent of automation and robotics. This transformation improves work safety significantly and also affords enhancement in productivity and consistency.

Traditionally, foundry process has been labor-intensive, involving a high degree of manual work. Workers were required to



perform tasks such as molding and casting, often under harsh and hazardous conditions. However, the introduction of automation and robotics is changing this situation.

Digitalization in Foundry Industry :

Like many other industries, foundries are moving towards "smart" technology. The term - Digitalisation in Foundries has been used to denote various automation, IT or computer based improvements. Many firms are now using the term Foundry 4.0. Both the terms involve making the overall foundry process "smart" with the aid of low cost automation, remotely operated arms, remotely operated vehicles, programmed and automatic robotic arms, cameras and sensors to collect data at various points of the process, office IT infrastructure, and many

others.

Digitalization or Industry 4.0 is centered around increasing the use of advanced technology to automate routine tasks. This technology combines existing data with machine learning to create optimized industrial processes.

Foundry automation has several benefits, including increased ROI, safer work environments, reduced worker strain, and more accurate work. These benefits save foundries time, money, and energy and make the workflow smoother. As more smart technology is introduced, this automation becomes accessible to more foundries.

TOWARDS DIGITALIZATION / FOUNDRY 4.0

New Equipment

Foundry automation can be achieved by replacing existing equipment with new equipment which are now available and comply to modern standards.

Older equipment require higher maintenance and labour compared to newer foundry technology. For example, many foundries use separate sand conditioning, casting/cooling, and shakeout equipment. However, newer equipment, can do all three simultaneously in one machine while taking up less space and energy. New equipment increases digitalisation, but is an expensive proposition,



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Director, Janyu Tech Pvt. Ltd.

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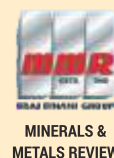
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Technology



The above figure shows that when there are large numbers of unsafe and hazardous conditions, chances of accident events and thereby chances of injuries increase.

requiring high capital expenditure.

Robots

Buying and installing Robots is another way to move towards Foundry 4.0. Robots automate routine repetitive activities.

Automating parts of the material handling process using robots can enhance safety in the foundry.

Foundry workers have several health risks, such as long-term exposure to fumes, dust, and gases. Prolonged exposure can result in respiratory diseases, an increased risk of cancer, and other diseases.

A simple way of reducing unsafe condition is by removing human being from the hazardous area and carry out the activity with the help of a robot. Many Foundries now use robots to handle high-temperature materials. This eliminates the risk of burns and other injuries associated with foundry work. Remotely

operated robots can also keep humans at a safe distance from hazardous fumes, dust and gases.

Robots are not only for enhancement of safety or replacing manual labour, It's about enhancing precision and consistency in the production process. Robots are programmed to perform tasks with a high degree of accuracy, reducing errors and waste. Precision leads to improved product quality, which in turn increases customer satisfaction and boosts business performance.

Complex and highly intricate designs are very difficult for even experienced personnel, but the same can be achieved with ease with the help of robots. Foundries are now able to offer tailor-made and customised solutions with the help of robots giving them unique position in the market.

Moreover, automation and robotics are driving efficiency in the foundry and

forging industry. Robots can work round the clock without breaks, significantly increasing production rates. They can also handle multiple tasks simultaneously, further boosting productivity. This increased efficiency translates into cost savings for businesses, making them more competitive in the market.

Digitalization of Supply Chain

Automating the whole supply chain is yet another way of boosting performance.

Materials are tracked right from the procurement, inwarding, usage and until shipment of finished products. Simple weight recording, picture recognition or bar coding systems can keep track of most of the flow of materials inside a foundry. Tracking and communication is not limited to the shop floor of the foundry but is also extended to the vendors and customers. At all stages, information is collected, recorded and exchanged as frequently as possible. This has helped foundries in minimizing their inventories and has enabled them to respond more quickly to changes in the situations.

Smart supply chain softwares allow analysis of optimal ways of obtaining materials. Using AI, softwares can also predict delays within a supply chain.

Smart-Die Casting

Foundry automation includes smart-die casting. Damaged castings, mistakes, and quality control are common challenges in metal casting. When mistakes occur in the casting process, it leads to significant losses. Using



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Technology

machine learning software, smart-die casting can reduce these mistakes significantly.

Foundry Automation Using AI

Foundries can analyse existing data with the help of algorithms. Making

concerned about job losses as robots take over tasks previously performed by humans. Managements have to take due care to explain that AI is not meant to replace operators and engineers AI increases accuracy and automates



informed decision based on analysis of existing data is what is known as Machine learning Artificial Intelligence (AI) has been in the news in a big way of late. Most AI, uses machine learning. Foundry engineers can use AI to automate tasks, such as die casting. AI can help foundries minimize scrap and reduce costs. With the help of AI, one can create simulation of castings and minimise scrap metal. All this is done

on a computer and without the need of prototyping, thus saving time and reducing costs. Documenting all procedures and creating Knowledge bank can also help in training and transfer of knowledge.

Challenges

Change management is the biggest challenge when a foundry embarks on a mission to carry out automation with the help of robots. Workmen are

many processes. An engineer or other personnel will oversee the AI to ensure there are no errors and everything is running smoothly.

Training and upskilling of workers is also required to operate and maintain these automated systems. Despite these challenges, the benefits of automation and robotics in the foundry and forging industry far outweigh the drawbacks.

Janyutech Private Ltd is a company in the field of robotics and AI. Janyutech specializes in remotely operated vehicles and arms. These help in keeping

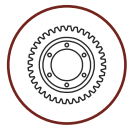
humans at a safe distance from dust, fumes, hazardous gases and hot material. Personnel are not only safe but are also able to perform better without excessive fatigue which comes from unhealthy, hot and hazardous atmosphere.

Janyutech has provided metal industry with remotely operated charging vehicle helping humans away from splashes of molten metal. A crust breaker or a poking machine are other examples in metal industry, variations of these can easily be adopted to improve productivity and safety of Foundry industry .

Conclusion

Revolution of automation and robotics in the foundry and forging industry is a inflection point. It will drive efficiency, safety, quality, and innovation. Trend towards automation, digitalization or foundry 4.0 is bound to continue and every business will have to per force adopt it to keep up with the changing world. Not being part of this revolution carries the sisk of becoming less competitive, out dated and not in sync with the customer needs. Adoption of automation and robotics in the foundry is indeed a game-changer, marking a new era in the industry. ■





Base Metals Surge in April : Factors & Forecasts

Base metals prices experienced significant gains in April. Copper, Aluminum, Zinc, and Lead all saw stellar gains with Zinc and Copper recording double-digit percentage increases on the London Metal Exchange. The rally was mainly driven by optimism of an interest rate cut in the United States. Copper gained significantly as a slump in smelter fees led to fears of capacity curtailment by smelters. Base metals market were also shaken as The US and UK imposed new restrictions on trading Russian aluminum, copper and nickel produced on or after April

all three metals.

Copper price have breached the \$ 10,000 mark for the first time since 2022 driven by a multiple factors. The unexpected tightening of the global mine supply, led by First Quantum's mine in Panama, which has taken over 4000,000 tonnes of copper out of the world's yearly supply, is the primary driver of the metal's surge. Anglo American also announced a 200,000-ton reduction in output. In addition, the largest copper producer in the world, Codelco, is having difficulty rebounding from its lowest output in 25 years. The state-owned company's wholly-



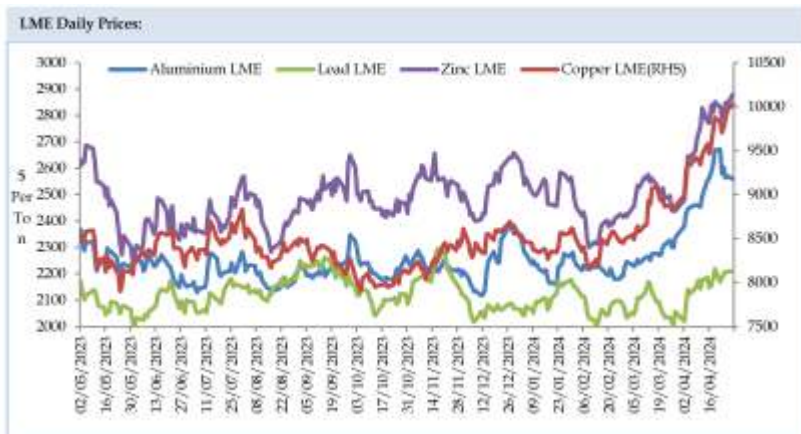
Ravi DSouza
Sr Research Analyst
Nirmal Bang Securities

9.6% from the first three months of last year, as per latest data reported by Codelco. Earlier this month Ivanhoe Mines reported a 6.5% quarterly drop in output at the giant Kamo-a-Kakula mining complex in the Democratic Republic of Congo, while drought conditions in neighboring Zambia are also putting the country's major planned expansion of mined output at risk.

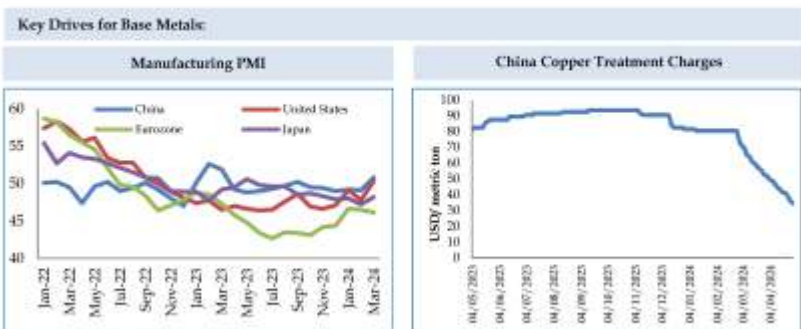
Adding to the string of supply issues, Chile, the world's biggest copper producer, has trimmed its estimate for production in 2024. Production for 2024 is now expected to come in at 5.51 million tons, revised from the earlier estimate of 5.63 million tons, copper commission Cochilco said in a statement.

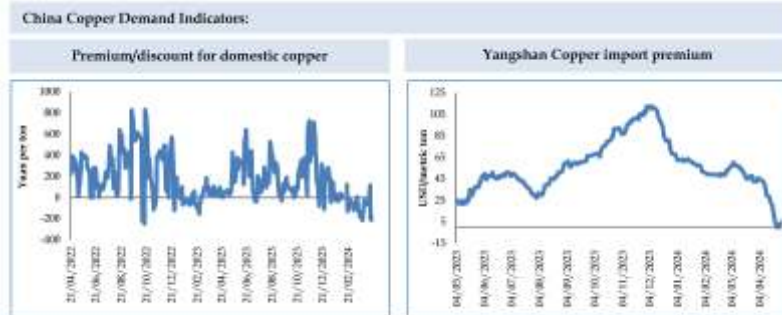
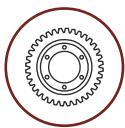
Smelter capacity expansion combined with a tightening of ore supply brought on by many supply disruptions at mines in important copper ore producing regions has resulted in a decline in spot treatment and refining costs below the \$50 floor price set by Chinese smelters.

Copper price have rallied over 15% in the past two months driven by an improving outlook for global manufacturing and mine disruptions. However, key indicators of demand in the spot market are flashing warning signal. Firstly the Yangshan copper import premium has slumped to zero on the 24th of April indicating



Source: Bloomberg, NB Research



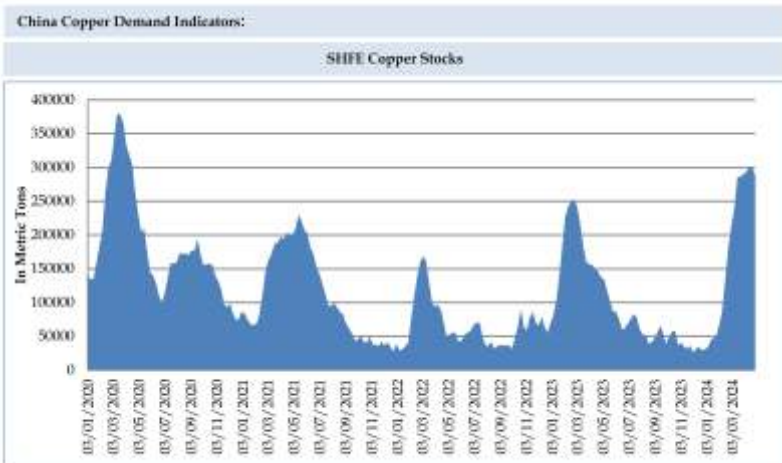


Source: Bloomberg, NB Research



weak spot demand for the metal. Another indication of poor demand is the fact that the domestic discount to the Shanghai futures benchmark is currently at its biggest level since 2022. Inventories on the Shanghai futures exchange warehouse too have swelled since the start of the year and are now at the highest since April 2020. Analyzing the key copper drivers we are of the view that Copper prices can continue its stellar run in the long term as mounting supply

and lack of demand in the spot market indicated by the slumping premiums is likely to weigh on prices. Also, the US's inflation rate is still sticky, according to the most recent macro data, and the central bank's measures have not produced the expected outcomes. Fed fund futures now indicate a 45% chance that the U.S. central bank will lower its benchmark rate by a quarter point in September from an earlier expectation for a rate cut in June. With the



Source: Bloomberg, NB Research

disruption coupled with demand from the renewable energy sector will keep prices elevated. In the short term, the upside to copper prices might be capped as mounting inventory in China

expectation of a rate cut in 2024 dimming and the weak spot market indicators we would advise to exercise caution in Copper as a correction in the near term is imperative. .





Hydro presents scrap material as designer material at Milan Design Week

More than 10 million tonnes of furniture are thrown away in Europe every year and the demand for low-carbon, recycled products is growing. Hydro has challenged seven world renowned designers to design furniture made from Hydro CIRCAL 100R, the world's first aluminium made entirely from recycled post-consumer scrap on an industrial scale. It was presented at Hydro's exhibition 100R at Milan Design Week.



Industrial designers are important influencers of material selection in all industries. That is why Hydro has been part of Milan Design Week for years, where half a million people gather every spring to view the latest from the world of design.

For the 100R exhibition, Hydro's experts have worked closely with selected designers, from the initial design idea to the final prototypes.

"Why does an aluminium and renewable energy company like Hydro work with designers? Because we believe in the power of partnerships. By working with leading designers, we want to challenge the way things are made and pull the industry in a greener direction by getting more manufacturers to understand how to select materials based on sustainability aspects," says Trond Olaf Christophersen, Executive Vice President Corporate Development and acting CFO in Hydro.

Through uniting with designers, Hydro shows how scrap can be turned into pristine looking design objects. (Photo: Einar Aslaksen/Hydro)

Recycling is the fastest way towards Hydro's goal of delivering zero-carbon aluminium and growth in recycling is a key part of Hydro's 2030 strategy. With a growing demand for low-carbon, recycled products, Hydro works closely with its customers to create recycled solutions which comply with their product specifications. This unlocks the potential for more use of recycled materials in new segments such as transportation, renewable energy

infrastructure and consumer durable goods.

Inspiring designers from all industries to consider recycled materials

Of the 10 million tonnes of furniture* that is thrown away in Europe every year, only 10 percent is recycled. This means designers have a powerful role to play in accelerating the green transition, as up to 80 percent of a product's environmental impact is decided at the drawing board, material selection and how the product is designed decided whether it can easily be recycled after use.

Access to low-carbon, recycled materials is crucial to lower the footprint of furniture.

"We are moving towards a future where utilizing materials already in circulation is imperative for sustainable living and manufacturing. Through uniting with designers, we want to show how scrap can be turned into pristine looking design objects, ready for mass production, while paving the way for the green transition," says Asle Forsbak, 100R project lead and Marketing & Communication Director at Hydro Extrusions.

Hydro's 100R exhibition at the 2024 Milan Design Week. The designers collaborating with Hydro at the exhibition are Inga Sempé, Max Lamb, Andreas Engesvik, Shane Schneck, Rachel Griffin, John Tree and Philippe Malouin. (Photo: Bjørn Jacobsen/Hydro)

Aluminium's footprint can vary dramatically depending on production methods. Aluminium produced using fossil fuels carries a much heavier burden than recycled



aluminium or aluminium produced using renewable energy sources. This is why Hydro is a champion for clear material labeling across industries.

By recycling post-consumer scrap, which is aluminium that has lived a life as an old window frame, a used car part, or other product, the material reaches a very low carbon footprint. Hydro CIRCAL recycled aluminium is available with 75 percent post-consumer scrap and with 100 percent post-consumer scrap in limited amounts. Hydro CIRCAL 100R has a carbon footprint below 0.5 kilo CO₂ per kilo aluminium, 33 times lower than the global average.



ALUMINIUM CHINA 2024 to unveil in Shanghai in July 2024

ALUMINIUM CHINA, Asia's premier tradeshow and B2B platform for the aluminium industry and its main application fields, is set to return to Shanghai, China on July 3rd to 5th. Organized by RX Greater China, this highly anticipated event aims to create a unique space where global industry professionals and suppliers come together, explore business opportunities, and foster innovation through exhibition, networking events, and concurrent forums.

Hosted at the Shanghai New International Expo Centre, the annual trade fair ALUMINIUM CHINA, is now open for registration. It brings together top-tier resources across



the aluminium value chain, facilitating collaboration between upstream and downstream businesses and promoting sustainable development of the industry.

Interested visitors can register via the link:

<https://reed.infosalons.com.cn/reg/ALU24/>

"In 2023, driven by the rapid advancements in new energy vehicles and photovoltaics, China's aluminium market has experienced substantial growth. This expansion signals immense potential for further development in the years ahead. Additionally, aluminium, known for its lightweight properties and recyclability, continues to gain favour across global markets and industries, especially in the context of sustainable and environmentally friendly practices. Against this backdrop, ALUMINIUM CHINA 2024 is scheduled to be co-located with Copper China and Asia's Lightweight Automotive Trade Fair. This resourceful integration aims to maximize opportunities for global buyers and suppliers within the non-ferrous metals industry and related application sectors. By providing a comprehensive business platform, the event fosters business cooperation, technology sharing and networking, contributing to the overall growth and innovation in the industry," stated Chris Zang, Senior Project Director at RX Greater China.

Converging global resources on one platform with an unprecedented scale

Anticipated to welcome over 28,000 visitors, the 19th edition of ALUMINIUM CHINA centers around the innovation and applications of aluminium products, processing equipment, and other non-ferrous metals, including copper and magnesium. The expansive show floor spans an impressive 50,000 square meters. The event's international reputation has grown significantly, with this year's edition poised to attract more than 1,800 overseas attendees from over 80 countries and regions.

In 2024, streamlined Chinese visa application processes and visa-free policies for multiple countries—including Switzerland, Ireland, Hungary, Austria, Belgium, Luxembourg, France, Germany, Italy, the Netherlands, Spain, Singapore, Malaysia, and Thailand—have made international business exchanges even more convenient. Capitalizing on these favourable policies, ALUMINIUM CHINA introduces the International Visitor Benefits Program, a new initiative aimed at global buyers.

This program will facilitate attendance at the exhibition, allowing visitors to explore premium, high-quality aluminium products, and processing equipment displayed by both Chinese and international manufacturers.

Visitors will also benefit from a range of on-site events curated by ALUMINIUM CHINA, including the ALU Insight International Aluminium Industry Development Forum, business matching sessions, and factory tours. These opportunities provide insightful updates on the market, boost business prospects, and offer a glimpse into advanced technology and solutions for aluminium processing.

Exploring Multi-Exhibition Collaboration to Drive Industry Innovation

After years of rapid development, China has emerged as the largest manufacturer and consumer of copper globally, establishing a robust presence in the industry. To empower professionals in the global non-ferrous metals sector and related application fields, the show creates a comprehensive platform where visitors can connect with diverse suppliers of non-ferrous metals, industrial materials, processing equipment, and auxiliaries.

RX Greater China has partnered with the China Nonferrous Metals Industry Fabrication Association (CNFA) to introduce the 2024 Shanghai International Industrial Materials Exhibition · Copper (Copper China). This dynamic tradeshow spotlights copper materials, semi-products, processing equipment, auxiliary materials, and engineering services related to the copper industry.

Global professionals from various application sectors—including wire and cable, automotive OEMs, photovoltaic energy storage, air conditioning and



refrigeration, electronic communication, and connectors—are invited to this trade fair. Serving as a global hub for technology exchange, business networking, and academic dialogues, Copper China fosters collaboration and knowledge sharing. Furthermore, RX Greater China will host a themed forum that brings together industry experts and forward-thinking minds. These forums will provide a platform for sharing expertise, experiences, and insights on market trends, advanced technologies, and the dynamic forces shaping the future of the copper industry.

Propelling Industry Development with Cutting-Edge Innovation

ALUMINIUM CHINA 2024, a global platform committed to driving sustainable development in the aluminium industry, is poised to unite over 600 domestic and international exhibitors. These industry leaders will showcase innovative products and state-of-the-art technology spanning the entire aluminium value chain. Aligned with its core objectives, ALUMINIUM CHINA has meticulously planned a series of on-site events that spotlight the diverse applications of aluminium across various sectors. By bringing together industry elites, these events shed light on the market's outlook.

"In the face of escalating competition within the aluminium industry, companies are adopting multifaceted strategies. They focus on product quality, cost optimisation, and groundbreaking innovations to gain a competitive edge. Simultaneously, they recognize the importance of collaboration to enhance their technological profiles and stabilize supply chains. ALUMINIUM CHINA 2024 will host themed forums and business matching services, fostering cooperation across the industry chain," emphasized Chris Zang, Senior Project Director at RX Greater China.

DRS delay disappointing, but far from unexpected - Alupro

Last week (25 April), the UK government published a statement confirming a delay to the introduction of the Deposit Return Scheme (DRS) for drinks containers to October 2027.

Alongside the delay, DEFRA revealed that decisions had been reached regarding joint registration and reporting, labelling, reciprocal returns, deposit level, minimum container size, and low volume sales. In addition, they reiterated that glass drink containers would be excluded from the scheme in England, Scotland and Northern Ireland, on the grounds of 'undue complexity' and 'handling costs'.

Commenting on the announcement, Tom Giddings,

executive director of Alupro, said: "Given the recent lack of progress, the long lead time needed for implementation and rumours of a delay circulating for a number of months now, today's announcement is far from a surprise. However, with the policy first announced in 2018 and two consultations subsequently held in 2019 and 2021, it's hugely disappointing that the scheme will have taken almost a decade since its inception to come to fruition.

"Developed with the ambition of further driving recycling rates, as well as reducing litter and plastic pollution, a well-designed DRS provides a once in a generation opportunity to revolutionise the circular economy of drinks containers. We have always wholeheartedly supported its implementation, with a number of important caveats, as outlined within our aluminium manifesto.

"It's frustrating to hear that the Government is putting its head in the sand when it comes to embracing an all-in scheme and supporting a fair and level playing field for all competing materials. Reversing this decision is probably somewhat of a foregone conclusion, however, even if excluded from the scheme, glass beverage containers should still be subject to equal collection and recycling targets under the EPR system.

"But material inclusion is just one of several decisions that still need clarifying. Now that the 2027 go live date has been confirmed, the Government must immediately turn its attention to ensuring that proactive decisions are made to ensure the scheme delivers the best possible long-term results.

"Firstly, it's imperative that the DRS should embrace a variable rate deposit, supported by a maximum deposit level that allows flexibility. This is critical to prevent imbalance in the market for beverage containers sold in multipacks. We've seen such a system implemented just this year in the Republic of Ireland to great success.

"Secondly, it's vital that the DRS is seen as a circular economy scheme, not an anti-litter one. Collected material should be accessible and available to the



recyclers of aluminium packaging, as it is now. This means that, once collected, the scheme can facilitate the supply of new recycled beverage containers – such as aluminium cans.

"Finally, the scheme must recognise the role aluminium's high value plays in funding the collection of aluminium cans in a DRS



News Update

and use this to offset the costs for obligated can-using businesses only.

"While the process we're currently going through has been thwarted with delays and change, we should not focus entirely on the negatives. Despite frustrations, the introduction of the scheme should be seen as a positive and, as an industry, we need work hard to maximise its long-term impact.

"Ensuring legislation is robust and delivers the maximum possible impact is pivotal. The government must therefore make big and well-informed decisions to create a dependable system for the future. After all, to achieve an effective DRS, we need to work collaboratively. Doing so is essential if we are to roll out a scheme that improves recycling rates and reduces litter.

Hydro Årdal opens new recycling unit with capacity to process 25,000 tonnes of post-consumer aluminium scrap annually

Hydro has invested NOK 100 million in recycling technology in the casthouse at the Årdal primary aluminium plant in Norway.

Alumobility and Porsche Reveal Results of Joint Aluminum Lightweight Study: A Conversion of the Porsche Taycan Top Hat from Mixed Material to a Full Aluminum Design at the Car Body Xperience Together with Porsche, Alumobility will present the results of a new joint study: "Aluminum Lightweight Study."

Novel recycling technologies for European Aluminium The AIT Austrian Institute of Technology is coordinating the EU project RecAL, which focuses on sustainability, circular economy and resource efficiency in the aluminium industry.

LME launches CBAM consultation and broader sustainability discussion paper

The London Metal Exchange (LME) have announced the launch of its consultation on the proposed integration of the EU Carbon Border Adjustment Mechanism (CBAM) requirements into the LME rules in order to support the aluminium market and value chain on implementing this pivotal environmental policy. In addition, the LME has issued a discussion paper, which seeks to further develop the LME's existing sustainability agenda, seeking views on proposals to drive forward initiatives that underpin the global transition to a sustainable economy.

Georgina Hallett, LME Chief Sustainability Officer, said: "Sustainability is increasingly at the forefront of our industry's agenda, with the significance and role that it plays growing substantially over the last five years. With the EU's policy change coming into effect, our proposal is designed to support the market with CBAM compliance – providing enhanced access and procedural efficiencies for the whole value chain – and pave the way for the integration of further regional policy changes that are expected to follow.

"Our discussion paper, which seeks feedback on a range of topics related to the broader sustainability landscape,

builds on the foundations put in place following the implementation of our 2020 discussion paper initiatives. The LME is proud of the steps it has taken to progress responsible sourcing standards within its market, and is committed to maintaining its leadership in this evolving landscape by supporting the development of new trends in our industry and continuing to build transparency around and access to sustainable metal."

CBAM consultation

The LME proposes to introduce new requirements from March 2025 for producers of all LME-listed aluminium brands (including primary aluminium, aluminium alloy and NASAAC) to upload verified emissions data to the LME's digital credentials register, LMEpassport, which will assist them in complying with the CBAM regulation. This will mean that metal owners taking delivery of any LME-listed aluminium brand through the settlement process will be increasingly confident that, regardless of where it has been produced, they will have or will be able to easily source the necessary information to import that metal into the EU should they so wish.

Embedding CBAM-relevant aluminium emissions reporting into LMEpassport will help lessen the administrative burden for producers, support the flow of information across the value chain, and help reduce friction at the EU border for LME-listed aluminium. It will equip all market participants, including traders and investors, with essential data to make informed decisions, supporting the integrity of the metals trading ecosystem.

Sustainability discussion paper

The LME's sustainability discussion paper explores areas of development such as sustainability-related pricing, particularly in relation to low carbon aluminium, and potential further services to assist with the CBAM regulation, including hedging tools to manage carbon pricing. The paper also explores the potential expansion of LMEpassport, the advancement of supply chain traceability, opportunities related to Environmental Product Declarations (EPDs) and the enhancement of processes, standards and measurements in the circular economy.

All of these potential development areas build on the LME's progress to date, first outlined in its 2020 Sustainability Discussion Paper, which includes:

Implementation of responsible sourcing requirements for all LME-listed brands, with close to 400 producer brands now adhering to international standards for human rights, governance, occupational health and safety and environmental management.

Introduction of additional scrap contracts, demonstrating strong growth and market response.

Launch and rapid growth of LMEpassport, showcasing producers' sustainability credentials and certifications.

The CBAM consultation and sustainability discussion paper feedback periods are both open for comments until 14 June 2024, 17.00 (BST), and the LME encourages feedback from all stakeholders from the industry, market and civil society.



Emirates Global Aluminium has announced the completion of the acquisition of Leichtmetall Aluminium Giesserei Hannover in Jb GmbH.

EGA announced its intention in March to acquire Leichtmetall from Leichtmetall Holding GmbH, a subsidiary of an investment fund managed by Quantum Capital Partners GmbH. The transaction has now cleared all required regulatory approvals and closing conditions.

EGA's new German operation is a European specialty foundry that uses renewable energy to produce up to 30 thousand tonnes per year of billets, with secondary aluminium as some 80 per cent of input material.

Production at Leichtmetall includes hard alloys and larger



diameter billets up to 1,150 millimetres, with uses including manufacturing high load bearing extruded profiles and very large forged components.

Leichtmetall adds to EGA's existing business in Europe. EGA already exports over 600 thousand tonnes of primary aluminium to the European continent each year, and is a significant supplier for industries including automotive and construction.

Abdulnasser Bin Kalban, Chief Executive Officer of Emirates Global Aluminium, said: "I am pleased to welcome our new Leichtmetall colleagues in Hannover to EGA. Becoming part of the biggest 'premium aluminium' producer in the world will give Leichtmetall new strength for its customers and to grow. For EGA, today is an important early milestone in our drive to build an aluminium recycling business in Europe, where we are already a major primary aluminium supplier, and around the world."

Thomas Witte, Chief Executive Officer of Leichtmetall, said: "This is an exciting moment for Leichtmetall, as we join forces with one of the biggest and most ambitious aluminium producers in the world and a major aluminium supplier in Europe. I am confident that as part of EGA we will be able to serve our customers even better, and develop our business further."

Market analysts expect global demand for recycled aluminium to double by 2040. Recycled aluminium is expected to account for around 60 per cent of the growth

in global aluminium supply between now and 2030, and around 70 per cent of supply growth between 2030 and 2040.

Aluminium is infinitely-recyclable. Recycling aluminium requires 95 per cent less energy than making new metal, generating a fraction of the greenhouse gas emissions.

The acquisition of Leichtmetall is EGA's first major transaction since the company's formation a decade ago through the merger of Dubai Aluminium and Emirates Aluminium.

Copper prices to remain upward for the next 6 years - Stanley Druckenmiller

The price of copper will hit new record highs over the next five to six years, according to billionaire investor Stanley Druckenmiller.

Druckenmiller told CNBC earlier this week that strong demand for copper from various growth industries — combined with supply imbalances due to the decade-plus lead time it takes to produce the metal from new mining operations — should push the price of copper higher over the next few years.

"Copper is a pretty simple story, takes about 12 years, greenfield to produce copper, and you got EVs, the grid, data centers, and believe it or not munitions. These missiles all got enough copper in them and the world's getting hot that we just think the supply-demand situation is incredible for the next five or six years," Druckenmiller said in the CNBC interview.

Growing demand for copper from defense industries appears especially timely given the \$95 billion military aid package the US recently approved for Ukraine, Israel, and Taiwan.

Copper prices are already pushing up against record highs. The commodity is up about 18% year-to-date, trading at \$4.68 per pound, which is just slightly below its all-time high of \$5.04 reached in March 2022.

This isn't the first time Druckenmiller has called out copper as a potential investment opportunity.

At the 2023 Sohn Investment Conference, Druckenmiller said copper was "in the tightest position, well frankly I've ever studied."

"Given the move toward EVs, given the usefulness of it in infrastructure spending, it's hard to believe copper won't be a huge beneficiary. The question is when am I supposed to buy it and how big is the exposure?" Druckenmiller said.

But due to concerns about a potential hard landing in the economy at the time, Druckenmiller was not yet ready to initiate a position in copper.

Druckenmiller's thinking has since changed, with his fourth-quarter 13F filing revealing that his family office initiated a \$20 million position in copper miner Freeport-McMoRan. Druckenmiller's first-quarter 13F filing, set to be released next week, will reveal whether he's gotten even more bullish on copper since then.



Domestic passenger vehicle sales rise by 11% in February – SIAM

As per the recent month data published by Society of Indian Automobile Manufacturers (SIAM) reported sharp increase in Passenger vehicle sales by 11 percent year-on-year jump in dispatches to dealers in February, as sports utility vehicles (SUVs) continued to drive demand. It was the highest-ever February dispatch by car manufacturers. Total dispatches of passenger vehicles (PVs) to dealerships stood at 370,786 units in February, 10.8 per cent higher than 334,790 units sent in February last year, data from the Society of Indian Automobile Manufacturers (SIAM) revealed.

Three-wheeler sales in February were at 54,584 units, up 8.3 percent. Two-wheelers continued their growth path selling 15,20,761 units in February, which was a sharp 34.6 percent jump. But the sales of commercial vehicles (CVs) remained muted. It saw a 0.7% decline in the wholesale volumes in February.

Vinod Aggarwal, President, SIAM said, "Passenger vehicles, two-wheelers, and three-wheelers have posted growth in February 2024 compared to the previous year,

while commercial vehicles have witnessed a slight de-growth. Overall robust GDP growth of the country in Q3 of 2023-24 has helped the auto sector.

The Bharat Mobility Global Expo 2024 held in February 2024, graced by the Hon'ble Prime Minister, has also created a strong positive sentiment for the consumers and therefore the industry expects the growth momentum to continue."

SUVs, meanwhile, remained the major growth driver. Mahindra and Mahindra said on Monday that its SUV sales in the domestic market jumped 40 percent in February. PV exports have grown by 20.5 percent, while two-wheeler exports have grown by 39.5 percent.

Honda Motorcycle & Scooter India's (HMSI) scooter exports have more than doubled from 13,365 units in February 2023 to 28,008 units in February 2024. Hero MotoCorp's motorcycle exports have also nearly doubled to 22052 units this February from 11689 units last February.

Domestic Sales: Monthly

Category Segment/Subsegment	Domestic Sales (In Nos.)	
	February	
	2023	2024
Total Passenger Vehicles³	3,34,790	3,70,786
Three Wheelers		
Passenger Carrier	38,777	42,582
Goods Carrier	8,711	10,013
E-Rickshaw	2,615	1,509
E-Cart	279	480
Total Three Wheelers	50,382	54,584
Two Wheelers		
Scooter/ Scooterettee	3,91,054	5,15,340
Motorcycle/Step-Throughs	7,03,261	9,64,362
Mopeds	35,346	41,059
Total Two Wheelers	11,29,661	15,20,761
Quadricycle	107	36

³ BMW, Mercedes, JLR & Volvo Auto data are not available. Tata Motors Domestic Sales data included only in "Total PV", detailed break-up is not available. However, without Tata Motors, "Total PV" would be 2,91,928 for February 2023 and 3,19,519 for February 2024



SIAM						
Segment wise Comparative Production, Domestic Sales & Exports data for the month of February 2024						
(Number of Vehicles)						
Category	Production		Domestic Sales		Exports	
Segment/Subsegment	February		February		February	
	2023	2024	2023	2024	2023	2024
Passenger Vehicles (PVs)*						
Passenger Cars	1,69,626	1,51,538	1,42,201	1,15,937	25,207	31,440
Utility Vehicles (UVs)	1,58,602	2,21,965	1,38,238	1,91,435	19,512	21,819
Vans	11,550	13,248	11,489	12,147	140	784
Total Passenger Vehicles (PVs)	3,37,978	3,86,741	2,91,928	3,19,519	44,859	54,043
Three Wheelers						
Passenger Carrier	56,978	65,687	38,777	42,582	19,386	25,203
Goods Carrier	8,191	10,797	8,711	10,013	254	638
E-Rickshaw	2,516	754	2,615	1,509	-	-
E-Cart	407	567	279	480	-	-
Total Three Wheelers	68,092	77,805	50,382	54,584	19,640	25,841
Two Wheelers						
Scooter/ Scooterette	4,40,901	5,67,463	3,91,054	5,15,340	33,378	47,364
Motorcycle/Step-Throughs	8,72,062	12,19,447	7,03,261	9,64,362	2,01,097	2,80,142
Mopeds	35,706	42,624	35,346	41,059	612	576
Total Two Wheelers	13,48,669	18,29,534	11,29,661	15,20,761	2,35,087	3,28,082
Quadracycle	452	331	107	36	348	456
Grand Total	17,55,191	22,94,411	14,72,078	18,94,900	2,99,934	4,08,422
* BMW/ Mercedes/ JLR/ Tata Motors and Volvo Auto data is not available Society of Indian Automobile Manufacturers (12/03/2024)						

SIAM						
Summary Report: Cumulative Production, Domestic Sales & Exports data for the period of April-February 2024						
Report I (Number of Vehicles)						
Category	Production		Domestic Sales		Exports	
Segment/Subsegment	April-February		April-February		April-February	
	2022-23	2023-24	2022-23	2023-24	2022-23	2023-24
Passenger Vehicles (PVs)*						
Passenger Cars	19,72,794	17,88,659	15,79,029	13,98,836	3,72,497	3,91,631
Utility Vehicles (UVs)	19,82,297	24,42,849	17,57,158	22,11,831	2,18,478	2,10,638
Vans	1,28,805	1,32,929	1,25,593	1,33,538	457	7,236
Total Passenger Vehicles (PVs)	40,81,696	43,64,437	34,61,780	37,42,205	5,91,432	6,09,505
Three Wheelers						
Passenger Carrier	6,61,579	7,74,583	3,20,983	5,02,125	3,41,819	2,72,257
Goods Carrier	89,553	1,04,148	86,679	99,864	4,396	3,439
E-Rickshaw	24,641	28,737	23,936	29,595	-	-
E-Cart	3,055	3,407	2,830	3,442	-	-
Total Three Wheelers	7,78,828	9,10,875	4,34,408	6,35,026	3,46,215	2,75,696
Two Wheelers						
Scooter/ Scooterette	51,13,161	58,42,185	47,53,085	53,72,713	3,74,014	4,68,460
Motorcycle/Step-Throughs	1,23,79,726	1,33,19,166	94,14,380	1,06,73,137	30,29,006	26,60,607
Mopeds	3,99,946	4,44,480	4,04,753	4,40,936	3,528	2,232
Total Two Wheelers	1,78,92,833	1,96,05,831	1,45,72,218	1,64,86,786	34,06,548	31,31,299
Quadracycle	2,356	4,196	620	694	1,854	3,536
Grand Total	2,27,55,713	2,48,85,339	1,84,69,026	2,08,64,711	43,46,049	40,20,036
* BMW/ Mercedes/ JLR/ Volvo Auto data is not available and Tata Motors data is available for April-December only Society of Indian Automobile Manufacturers (12/03/2024)						



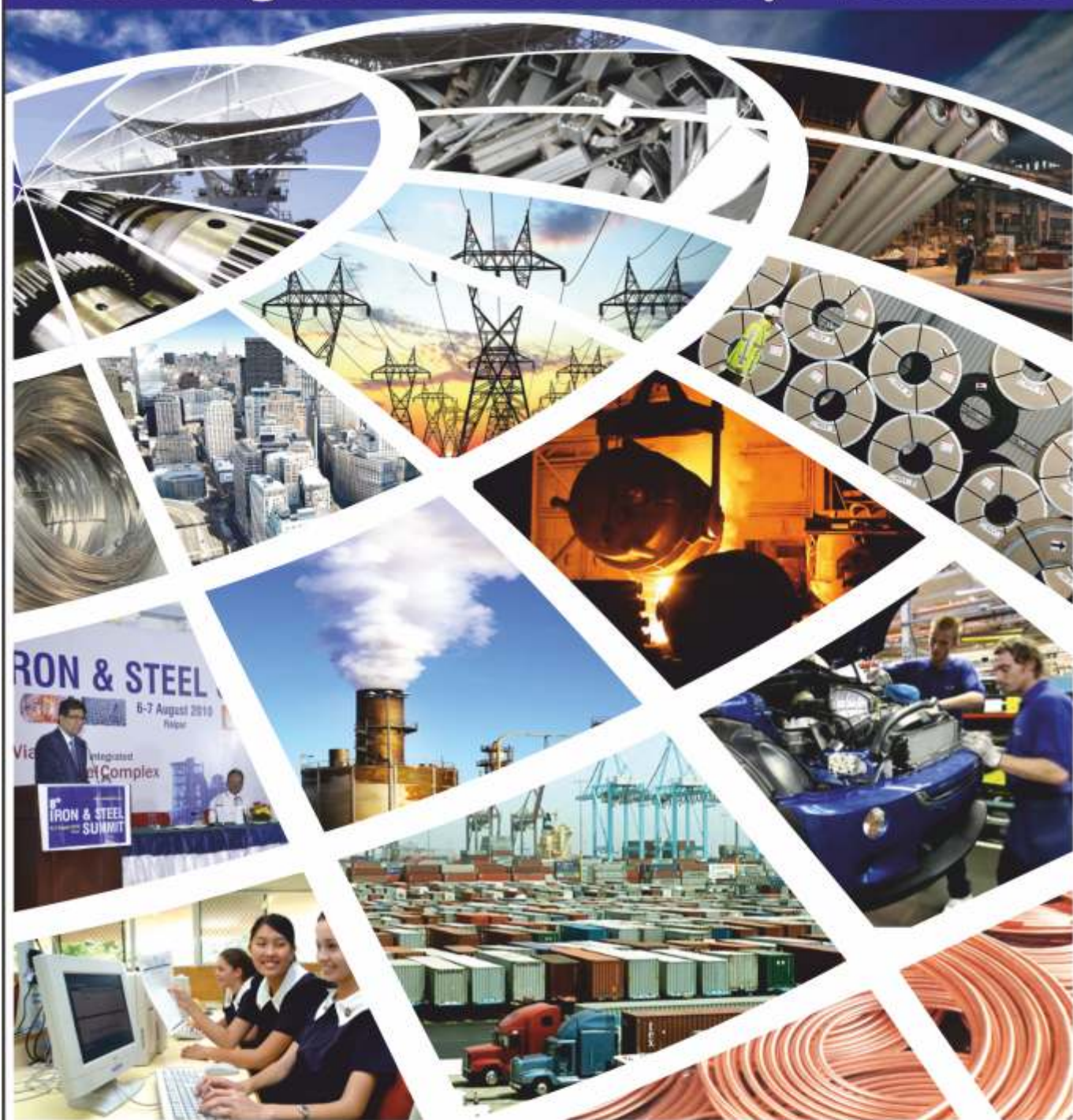
Statistics

SIAM												
Category & Company wise Summary Report for the month of February 2024 and Cumulative for April-February 2024												
Report II												
(Number of Vehicles)												
Category	Production				Domestic Sales				Exports			
Segment/Subsegment	February	April-February	February	April-February	February	April-February	February	April-February	February	April-February	February	April-February
Manufacturer	2023	2022-23	2023	2022-23	2023	2022-23	2023	2022-23	2023	2022-23	2023	2022-23
Passenger Vehicles (PVs)												
FCA India Automobiles Pvt. Ltd	1,000	370	15,387	8,066	917	331	11,705	4,081	630	160	4,612	4,010
Force Motors Ltd	42	142	663	1,170	60	98	577	1,582	1	-	5	3
Honda Cars India Ltd	9,535	15,990	1,06,687	1,15,566	5,025	7,142	87,726	79,513	969	5,536	19,527	30,729
Hyundai Motor India Ltd	55,401	67,599	5,47,478	7,16,203	47,537	50,201	5,16,945	5,61,720	10,880	10,300	1,42,119	1,50,555
Isuzu Motors India Pvt. Ltd	65	47	1,971	306	65	23	857	483	-	-	355	6
Kia Motors India Pvt. Ltd	30,389	22,723	3,29,395	2,75,944	24,600	20,200	2,47,728	2,24,234	7,408	7,308	79,554	50,403
Mahindra & Mahindra Ltd	30,876	44,103	3,30,225	4,32,639	30,355	42,401	3,23,266	4,19,246	1,400	590	9,659	10,586
Maruti Suzuki India Ltd	1,56,438	1,74,543	17,27,981	17,85,813	1,47,497	1,60,271	14,74,107	16,07,103	18,956	25,670	2,26,115	2,55,150
MG Motor India Pvt. Ltd	4,327	4,572	49,857	43,072	4,193	3,030	42,615	40,623	-	-	2	-
Nissan Motor India Pvt. Ltd	7,253	6,052	87,375	66,420	2,184	2,755	30,351	27,445	3,882	3,163	53,373	30,031
PCA Motors Pvt. Ltd	3/3	7/0	1,128	8,060	328	421	7,047	7,361	-	253	-	2,588
Renault India Pvt. Ltd	10,102	1,898	1,11,170	13,935	3,615	4,080	73,537	71,214	1,537	88	29,477	10,429
Skoda Auto India Pvt. Ltd	4,225	2,915	51,561	42,552	3,415	2,254	47,837	41,718	118	-	405	1,402
Tata Motors Ltd	NA	NA	4,09,173	4,17,241	NA	NA	4,08,087	4,24,350	NA	NA	1,765	1,988
Toyota Kirloskar Motor Pvt. Ltd	22,485	33,698	1,43,323	3,20,686	15,323	23,293	1,54,798	2,20,304	347	7,520	555	15,322
Volkswagen India Pvt. Ltd	5,334	7,430	62,377	87,241	3,311	3,019	37,446	39,566	755	6,695	23,506	39,576
Total Passenger Vehicles (PVs)	3,37,978	3,86,741	40,81,686	43,64,437	2,91,928	3,19,519	34,61,780	37,42,205	44,889	54,043	5,91,432	6,09,505
* Only summary data is provided for April-2024. NA-Not Available												

SIAM												
Category & Company wise Summary Report for the month of February 2024 and Cumulative for April-February 2024												
Report II												
(Number of Vehicles)												
Category	Production				Domestic Sales				Exports			
Segment/Subsegment	February	April-February	February	April-February	February	April-February	February	April-February	February	April-February	February	April-February
Manufacturer	2023	2022-23	2023	2022-23	2023	2022-23	2023	2022-23	2023	2022-23	2023	2022-23
Three Wheelers												
Atul Auto Ltd	1,810	2,253	22,392	23,717	1,537	2,120	19,966	20,912	185	180	2,397	1,559
Bajaj Auto Ltd	42,749	50,547	4,15,555	5,38,343	37,849	36,331	2,65,379	4,28,055	1,505	15,155	1,72,100	1,40,706
Continental Engines Pvt. Ltd	282	451	5,642	5,967	297	357	5,743	5,711	-	-	-	-
Force Motors Ltd	350	200	2,802	3,743	-	-	-	-	196	14	2,600	3,640
Mahindra & Mahindra Ltd	5,196	5,225	53,793	72,106	5,350	6,168	52,823	72,310	-	60	453	453
Piaggio Vehicles Pvt. Ltd	8,137	8,818	89,465	1,02,914	8,606	7,552	75,225	91,335	(97)	1,884	23,814	11,577
TVS Motor Company Ltd	5,368	10,300	7,59,475	1,34,385	7,243	2,086	7,4740	18,703	7,781	8,548	1,44,781	1,17,321
Total Three Wheelers	68,092	77,805	7,78,828	9,10,875	50,382	54,584	4,34,408	6,35,026	19,640	25,841	3,46,215	2,75,696
Two Wheelers												
Ather Energy Pvt. Ltd	12,092	10,658	81,356	96,655	12,111	11,094	80,658	96,073	-	80	-	2/6
Bajaj Auto Ltd	2,54,310	2,89,192	32,05,912	33,95,589	1,15,039	1,68,727	15,49,165	20,67,314	1,5,027	1,24,167	15,42,241	1,84,457
Chetak Technology Ltd	500	2,500	5,335	11,130	2,256	1,800	4,437	10,287	-	-	-	-
Horo Moto Corp Ltd	3,68,653	4,41,065	47,68,044	50,06,382	3,82,317	4,45,005	46,53,063	49,01,113	2,143	20,148	1,56,140	1,69,758
Honors Motorcycle & Scooter India Pvt. Ltd	2,25,405	4,01,302	43,87,426	45,11,550	2,27,024	4,13,907	38,27,985	41,72,045	20,111	44,744	3,10,891	3,35,031
India Kawasaki Motors Pvt. Ltd	516	247	2,878	2,615	3/5	458	3,647	7,090	-	-	-	-
India Yamaha Motor Pvt. Ltd	56,606	79,045	7,79,833	8,49,384	39,397	56,538	5,24,573	6,36,325	5,694	21,873	2,51,423	1,99,207
Mahindra Two Wheelers Ltd	-	-	72	-	-	-	-	-	-	-	-	-
Okinawa Autotech Pvt. Ltd	6,166	1,394	52,030	10,139	6,726	1,244	56,273	13,557	-	-	78	-
Piaggio Vehicles Pvt. Ltd	4,824	4,341	58,138	47,559	2,900	3,041	41,155	35,008	1,215	1,023	10,532	12,881
Royal-Enfield (Unit of Eicher Motors)	63,190	78,321	7,58,195	8,50,184	64,436	67,922	6,71,656	7,68,791	7,105	8,013	87,704	65,430
Suzuki Motorcycle India Pvt. Ltd	86,054	1,00,821	5,56,178	10,24,747	52,455	83,304	5,57,687	8,34,845	8,170	14,151	1,83,100	1,65,389
Triumph Motorcycles India Pvt. Ltd	52	45	592	808	87	89	979	800	-	-	-	-
TVS Motor Company Ltd	2,09,741	3,31,160	37,55,244	37,10,660	2,27,472	2,67,502	23,57,156	28,06,610	45,624	90,300	8,48,239	6,03,860
Total Two Wheelers	13,48,668	18,28,534	1,78,82,833	1,96,05,831	11,28,661	15,20,761	1,45,72,218	1,64,86,786	2,35,087	3,28,082	34,06,548	31,31,288
Quadracycle												
Bajaj Auto Ltd	452	331	2,356	4,195	107	36	620	694	345	456	1,854	3,536
Total Quadracycle	452	331	2,356	4,195	107	36	620	694	345	456	1,854	3,536
Grand Total	17,55,191	22,94,411	2,27,55,713	2,49,85,339	14,72,078	18,94,900	1,84,69,026	2,09,64,711	2,99,934	4,09,422	43,46,049	40,20,036
Source: Bureau of Applied Statistics, Government of India (2024)												

SIAM												
Segment & Company wise Production, Domestic Sales & Exports Report for the month of February 2024 and Cumulative for April-February 2024												
												Report III
(Number of Vehicles)												
Category	Production				Domestic Sales				Exports			
Segment/Subsegment	February	April-February			February	April-February			February	April-February		
Manufacturer	2023	2024	2022-23	2023-24	2023	2024	2022-23	2023-24	2023	2024	2022-23	2023-24
Three Wheelers												
A: Passenger Carrier												
Atul Auto Ltd	476	702	4,840	8,771	415	628	7,381	8,566	184	172	2,279	1,893
Bajaj Auto Ltd	38,826	46,100	4,00,251	5,19,247	28,588	31,807	2,37,250	3,79,172	11,374	14,647	1,70,478	1,59,250
Continental Engines Pvt Ltd	57	74	1,567	955	83	53	1,658	819	-	-	-	-
Force Motors Ltd	350	200	2,802	3,743	-	-	-	-	196	14	2,600	3,640
Mahindra & Mahindra Ltd	1,625	2,878	18,222	26,067	1,760	3,278	15,201	33,154	-	60	337	409
Piaggio Vehicles Pvt Ltd	8,132	8,817	81,204	92,623	6,514	7,907	49,110	51,960	(82)	1,880	22,618	10,626
TVS Motor Company Ltd	9,475	9,832	1,57,708	1,33,176	1,308	2,027	14,346	18,364	7,724	8,430	1,43,440	1,16,439
Total A: Passenger Carrier	58,978	66,887	6,61,679	7,74,683	38,777	42,682	3,20,953	5,02,125	19,386	26,203	3,41,819	2,72,267
E-Rickshaw												
Atul Auto Ltd	167	254	2,861	4,393	241	375	2,925	4,793	-	-	-	-
Continental Engines Pvt Ltd	99	251	1,323	4,112	90	189	1,342	4,010	-	-	-	-
Mahindra & Mahindra Ltd	2,250	259	20,437	19,732	2,284	945	19,989	20,792	-	-	-	-
Total E-Rickshaw	2,516	764	24,641	28,737	2,615	1,509	23,936	29,595	-	-	-	-
B: Goods Carrier												
Atul Auto Ltd	1,060	986	8,769	8,232	1,160	967	8,647	7,866	4	8	118	106
Bajaj Auto Ltd	3,023	4,741	35,304	48,795	3,900	4,530	34,523	46,883	192	209	1,522	1,456
Continental Engines Pvt Ltd	57	137	2,526	704	123	58	2,648	589	-	-	-	-
Mahindra & Mahindra Ltd	1,020	1,844	12,012	14,933	1,141	1,722	13,204	14,812	-	-	26	44
Piaggio Vehicles Pvt Ltd	2,005	2,921	28,261	30,291	2,287	2,657	27,115	28,375	1	304	1,188	951
TVS Motor Company Ltd	92	168	1,581	1,187	35	45	394	349	57	118	1,332	882
Total B: Goods Carrier	8,191	10,797	89,553	1,04,148	8,711	10,013	86,679	99,864	254	638	4,396	3,439
E-Card												
Atul Auto Ltd	107	331	1,102	1,822	121	250	1,045	1,697	-	-	-	-
Continental Engines Pvt Ltd	-	19	31	211	1	17	38	193	-	-	-	-
Mahindra & Mahindra Ltd	300	247	1,922	1,374	157	213	1,740	1,552	-	-	-	-
Total E-Card	407	567	3,055	3,407	279	480	2,830	3,442	-	-	-	-
Total Three Wheelers	68,092	77,805	7,78,828	9,10,875	50,382	54,584	4,34,408	6,35,026	19,640	25,841	3,46,215	2,75,696

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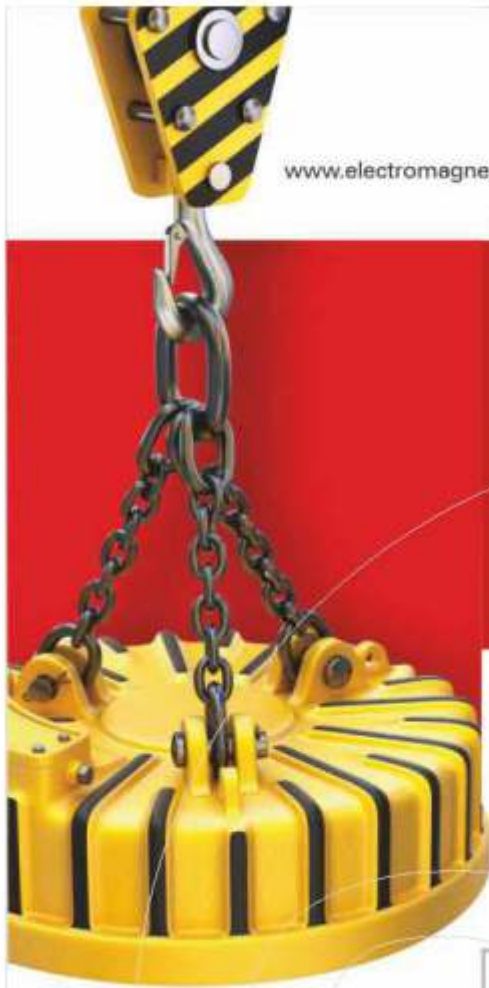
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