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Indian foundries expect lower electricity charges for the survival of the industry

*Sachin Rajendra Shirgaokar
Managing Director,
S.B. Reshellers Pvt. Ltd*

■ Copper production to show "strong and consistent" growth for next decade

■ EMG iTiM high-precision thickness measurement solution for metallic flat products

■ Material World- Shape of Things to Come: Bio-inspired Materials

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D. A. Chandekar Editor

Dear Readers,

'One can not imagine any industry without the use of metals. Metallurgy is the mother of all industries' or 'Industrial progress of any country can be measured in terms of steel produced in that country'. We used to hear such inspiring statements from our professors in engineering college and feel extremely proud of our branch. We (students of metallurgy branch) were almost sure of our very important role in the process of nation building in coming years.

Now more than 35 years after passing out, I see a totally different picture. Most of the metallurgy students from prestigious colleges either leave metallurgy to join the bullet train of IT or they leave the country for some research work. As such the number of metallurgical engineers graduating every year is very less compared to other branches like civil, mechanical, electrical etc. Now after the inclusion of modern streams like Electronics, IT, Computer Science, Telecom etc. the proportion has further reduced. Many years ago, Ministry of Steel had done one survey to assess the situation in metallurgical career. The results were astonishing. It was revealed that around 70 % of metallurgists leave metallurgy immediately after passing out. 'Most of my students go abroad. Who will be interested in thin packages they are offered by Indian companies ? As such Indian plants don't need engineers. They are run by diploma holders only.' These were words of HOD, Metallurgy of a A+ category institute in the country.

Editorial Desk



For many years, metallurgy branch and the career ahead was seen as dirty path, full of shop floor dust and ultra high temperatures. A young engineering graduate would dream of an AC office and a cozy environment to work in, surely not a 'pitside' or a 'meltshop' in a metal producing plant. Secondly, the salaries in the metallurgical line were really peanuts compared to those in other industries such as auto, IT, Telecom etc. I do agree that with the emergence of modern processes and adoption of automation and smart manufacturing technologies, metallurgical engineers also got shifted from an iron cabin besides the furnace or a rolling mill, to a central control room, fully air-conditioned and having big screens all over to monitor and operate the plant. Salary structure too improved a lot but a lot of ground still remains to be covered. Unless we match IT (and similar) sector salaries, the exodus of metallurgists will continue !

If India's economy is to grow by 7 to 8 % annually, it has to have a strong support from metallurgical industry. The infrastructure development, the main focus of our economy, will require huge quantities of metals. Apart from many other things required to match this demand, this will also require a big pool of technically qualified manpower. What can we, as industry, do to achieve this ? One, increase the seats for metallurgy branch in engineering colleges. Two, revise the salary structure to retain metallurgists. Three, start short orientation courses which can induct engineer from any stream into metallurgical function.

A stitch in time saves nine. If we don't act today, tomorrow it may be too late !

Write your comments :

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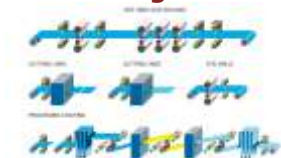
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Indian foundries expect lower electricity charges for the survival of the industry

"We are hopeful that the levy of export duty on iron ore and steel intermediates will also help in improving raw material availability, usher in price stability, and enhance the industry's competitiveness in the global market".

*Sachin Rajendra Shirgaokar
Managing Director,
S.B. Reshellers Pvt. Ltd*

Sachin Rajendra Shirgaokar is the Managing Director of S.B. Reshellers Pvt. Ltd since 2000. He joined the family business in 1990. The company is a part of the Shirgaokar Group which one of the world's largest sugar mill roller and machinery manufacturers.

He further completed his education from Fergusson College, Pune and then graduated as a mechanical engineer from Karnataka University in 1987.

He further continued to pursue his MBA from Manchester, USA and completed his education 1989. After a brief stint working as a Consultant in Manhattan, New York, he returned to India to join the family business and, under the guidance of

Mohan Shirgaokar and Anant Huilgol, started working at SBR which was then in its nascent stage.

In his tenure at SBR since 1990, Mr. Sachin has been instrumental in bringing the company from a — foundry to its current position. Under his leadership, the company first established its export division and expanded its reach to various countries in South East Asia, Africa, Australia, North and South America, among others, and established "Technology Tie-Ups" in many of these countries. During his tenure as Managing Director, SBR introduced many efficient and cost-effective innovations for the sugar industry including SBR Special Alloy, patented the Sleeve Kamal Roller and

expanded beyond sugar into industrial castings.

Additionally, he initiated the manufacturing patented roll turning lathes such as SBR 5000, Dynaturn and Megaturn. He also initiated the manufacturing of Whole stick Harvester for sugar cane cutting, which now is under final development. With the support of Sohan Shirgaokar, Joint Managing Director and Sudhir Shirgaokar, Director (Operations), he has built SBR as one of the known brands in the sugar industry. He also has a keen interest in developing a robust human-relations environment across all business units.

With the backing of Shirgaokar Group, Sachin along with Sohan Shirgaokar & Reddy, established, Synergy Green Industries Pvt. Sachin

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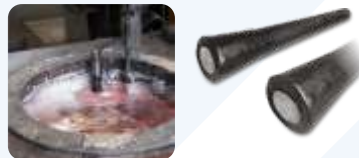
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Face to Face

Rajendra Shirgaokar has been the Managing Director of S.B. Reshellers Pvt. Ltd since 2000.

With the backing of Shirgaokar Group, Sachin along with Mr Sohan Shirgaokar & Reddy, jointly established, 'Synergy Green Industries Pvt. Ltd, in 2011. Synergy Green Industries is One of India's Leading Manufacturer of Large Size SG and Cast Iron, Steel Castings for Wind Mill and Other Heavy Engineering Applications with Capacity of 40,000 MPA.

Today the company produces 30,000 metric tons of wind turbine castings for many domestic and overseas clients. It is one of the few companies which went on BSE SME platform on 21st September 2018 and migrated to the main boards i.e. BSE and NSE on 28th July 2021.

D A Chandekar, Editor and CEO of Steelworld Magazine had an exclusive interaction with the Sachin Shirgaonkar, MD, S.B. Reshellers Pvt. Ltd, to understand more about present and future status of the India casting industry.

Excerpt:

Casting production in India stands at around 18 Mn tonnes and is expected to grow at around 12%. Around 40% of the casting produced is consumed by the automobile industry. Aluminium castings contribute to around 15% of market share and this will rise in future considering the shift of demand towards lighter material and the

demand from EVs. The growing Indian market and government spending will further increase the overall demand. The present Russia-Ukraine war and various issues with China will add to the order book of the industry. I see a very bright future for the foundry industry in India.

What needs to be done to enhance the export market share of the Indian castings?

The unprecedented surge in prices of raw material of steel has been a big challenge for the foundry industry in the recent months. The import duty reduction will lead to a lowering of prices and provide much-needed support to the industry. We are hopeful that the levy of export duty on iron ore and steel intermediates will also help in improving raw material availability, usher in price stability, and enhance the industry's competitiveness in the global market.

IIF had also been demanding reduction of import duty of high-grade PIG IRON, which is required for the manufacture of safety critical SG Iron castings for the Automotive Industry as well as Wind Energy equipment and export of certain items. IIF proposes to reduce Import duty on Pig Iron Containing less than 0.5% Phosphorus to Nil from 5% currently.

IIF had been advocating Technology upgradation fund for the foundry sector for a long time. There is a



huge opportunity for growth & improvement in global market share from less than 2% to 5-7% in 5 years in the backdrop of market sentiments post COVID being favourable to India. The industry needs to grow 3-fold in next 10 years to meet the demand of domestic manufacturing & engineering exports. This is achievable by improving technology, cost competitiveness, capacity, productivity, quality, development time for new products for global markets, especially by the MSMEs. The industry needs to invest in latest technologies to sustain and develop globally.

How important is technological up gradation for foundries?

Foundries should collaborate with research and development agencies and make available technologies to the units in the MSME sector. Innovation and technology up gradation are a



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Face to Face

continuous process. Readily available technologies from overseas cannot be directly adopted here. They have to be innovated and customised to suit the requirements of the foundry units in India. The industry here should also adopt new age best practices.

What are the specific issues facing the foundries around Kolhapur region?

The continuously changing prices of raw materials- such as pig iron and chemicals - has affected the execution of even the orders already placed. The prices have doubled for some raw materials.

The Russia-Ukraine war has led to this. We expect the situation to normalise, or at least, reverse the trend in the prices in coming weeks. Apart from this those foundries needing additional space to expand face issues with land availability. The electricity tariff is one of the highest in Maharashtra and unless drastic steps are initiated by the government to bring them down the industry's survival will be an issue and future expansions may not be viable.

How is IIF facilitating the growth of this industry?

IIF being a national body discusses various subjects

on local level to meet these challenges. It is very aggressive on the Policy advocacy matters and pushes these through various industrial bodies to various departments in the government. It arranges various seminars, conferences, exhibitions on technical, management and general subjects for its members.

What does the foundry sector expect from the policymakers?

Policy changes in electricity tariffs, overall support as expressed in the question related to exports would be the major expectations on immediate basis. ■

Sterlite Power defers IPO citing unfavourable market conditions



Vedanta Group unit Sterlite Power Transmission Ltd postponed its plans to go public through an initial public offer (IPO) citing unfavourable market conditions. The company, which had filed the DRHP in August, informed market regulator Securities and Exchange Board of India (Sebi) about the decision and sought to withdraw the DRHP, a company statement said.

"Given the volatility in the current markets and the limited window available under the currently filed DRHP, Sterlite Power has decided to withdraw the DRHP.

However, it remains observant of the market and will consider re-filing DRHP in the future. In the meantime, we are in conversation with large private capital institutions

to grow the business," Pratik Agarwal, managing director, Sterlite Power, said.

Sterlite Power planned its IPO worth ₹1,250 crore to raise funds for capital spending to expand its transmission operations. In its draft prospectus, the company said it would use the proceeds of the IPO to either fully or partly repay certain loans and for general corporate purposes.

The company received Sebi approval over its DRHP in December and it was valid for 12 months. In an interview to Mint in July, Agarwal has said that the company's proposed IPO would purely depend on the market conditions. "...it's not for us to decide on our own," he had said.

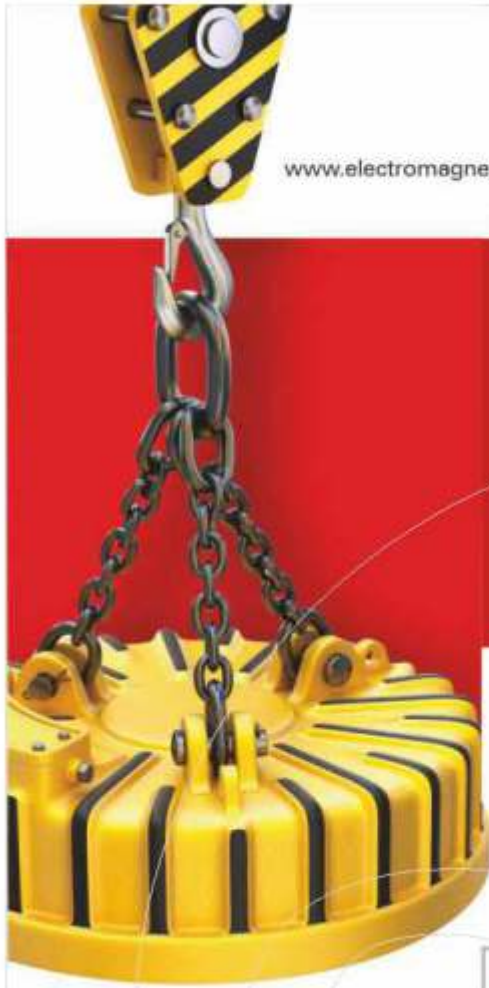
Noting that Sterlite Power continues to look at various fundraising options, Agarwal had said: "We are constantly looking for capital solutions which address the scale, the size, the valuation, the flexibility; all of those requirements that the capital should come with. And, right now, we have the option of the public markets, if the market supports and the investors are excited. But, of course, there are also private investors and that option also exists. So, we are evaluating everything."

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Feature



Copper production to show “strong and consistent” growth for next decade

As per the recent study by Fitch Solutions Country Risk and Industry Research forecasts 7.3 million tonnes will be added to global copper production through 2031 as a raft of projects in Chile, China and Congo come online.

Fitch expects global copper mine production to increase by an average annual rate of 3.2% over 2022–2031, with annual

output rising from 21.9mnt in 2022 to 29.2mnt by 2031 boosted by elevated copper prices and a positive demand outlook.

Chile

The market researcher says top producer Chile will show a slight decline in the short term due to ongoing drought affecting mines such as 'Anglo Americans Los Bronces and Antofagasta's Los

Pelambres operations, labour action at state-owned Codelco and unforeseen maintenance at Vale's mines.

However, longer term the country, which is responsible for a quarter of global production, will experience strong growth led by large scale miners. BHP is adding substantially to Escondida's output following the end of covid restrictions, Teck Resources' Quebrada Blanca



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Feature

Phase 2 project is expected to complete construction around the end of 2022, while Codelco is undertaking a \$1.6 billion project to overhaul its Salvadore mine and add 47 years to its mine life.

“Downside risks to long-term production stem from the possibility of a mining sector tax, which President Gabriel Boric is pursuing. Nevertheless, given significant opposition in Congress to the original proposals, we expect the impact on output to be limited,” says Fitch.

China

Fitch expects Chinese copper mine production growth to slow sharply from an average growth rate of 6.9% over the past decade to 1.0% through 2031 due to the shutdown of low grade mines and delayed capacity expansions.

Ramp ups at new projects,

including Yunnan Copper's Pulang mine and Zijin Mining's Qulong complex will offset declines elsewhere.

Peru

Fitch expects Peruvian output growth to slow dramatically in the near term from its earlier estimates due to community protests affecting key mines including MMGs Las Bambas and Southern Copper Corp's Cuajone mines. The authors of the report do not anticipate that annual production will reach pre-covid levels until 2024.

China will play an increasingly important role in Peru's copper sector, says Fitch, pointing to the country's Ministry of Energy and Mines forecast of a total of \$10.2 billion to be invested by Chinese firms in five mining projects over the next 10 years.

DRC

The Democratic Republic of the Congo, thanks mainly to Ivanhoe Mines and Zijin Mining's giant Kamoa-Kakula mine expansion, will exceed annual production of 2 million tonnes for the first time next year and reach nearly 3 million tonnes in 2031.

Glencore's restart of the Mutanda copper-cobalt mine and China Minmetals' Deziwa project, held with state-owned Gecamines will further add to the central African nation's strong growth.

Price slump

The copper price has been in retreat since hitting all-time highs in March and was last trading at \$3.28 a pound (\$7,230 a tonne) in New York, a 10-week low.

Fitch expects prices to average \$8,400 a tonne in 2023 and \$11,500 a tonne by 2031 as a long-term structural deficit emerges due to the very strong long-term demand outlook. ■

Vedanta scales up renewable power sourcing to 1,000 MW

Vedanta is scaling up its renewable energy (RE) sourcing to 1,000 megawatts (MW), accelerating transition of its operations to green energy.

The mining conglomerate has invited Expression of Interest (EOI) for an additional 500 MW of renewable energy.

Vedanta has set a

target to achieve 2.5 gigawatts (GW) of renewable energy for its operations by 2030, the company said in a statement.

Decarbonisation goals

Vedanta's Chief Safety Officer and Group CEO Sunil Duggal said, “It is a crucial step in achieving our 2.5 GW of renewable power by 2030. We are looking forward to

collaborate with the best in the industry, as we march ahead on our decarbonisation goals”.

The company has invited reputed, experienced, and financially strong players to submit their EOIs to supply hybrid renewable power for its manufacturing facilities located in Rajasthan, Chhattisgarh and Odisha. Vedanta previously secured 580 MW round the clock (RTC) RE through Serentica Renewables.

“Transforming for good”

Serentica Renewables Director Pratik Agarwal said, “The signing of 580 MW of RTC green power supply agreements with Serentica Renewables is a testament to the strong resolve by Vedanta to decarbonise its energy consumption and achieve net zero ambitions.” Aligned with Vedanta's ESG vision of “Transforming for Good”, the move is part of a series of actions to deliver on its goal of becoming Net Zero Carbon emitter by 2050 or sooner. Vedanta has committed \$5 billion over the next 10 years to accelerate transition to net-zero operations.





Innovative Foundry Solutions

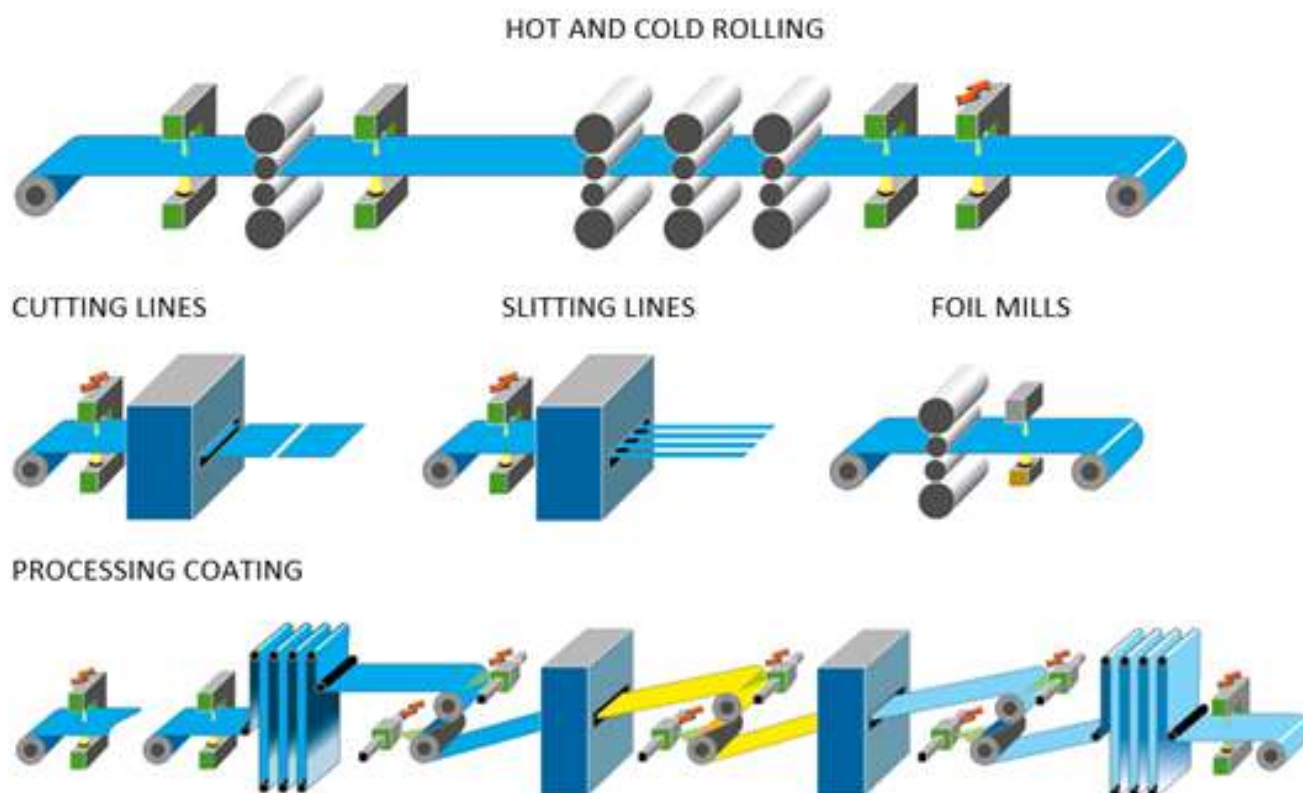
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EMG iTiM high-precision thickness measurement solution for metallic flat products

In May of this year, EMG Automation GmbH took over MESACON Messelektronik GmbH in Dresden and integrated the company's versatile thickness measurement solutions into the product portfolio of the "Business Unit Metals". This is an important step towards completing EMG's range of quality assurance systems for the manufacturing of metallic flat products. In addition to various width measurement solutions and the online geometry measurement of slabs, EMG now offers the complete

spectrum of thickness measurement systems required for almost every manufacturing and processing step.

The expansion of the product portfolio by the thickness measurement - under the product name EMG iTiM - means for the quality management the availability of a wide range of sensor and automation solutions from one source!

EMG iTiM solutions are characterised by the combination respectively use of a wide variety of physical

measuring methods, a high degree of flexibility in design and easy integration into the user's automation environment. The new systems ideally complement the solutions for online oil film thickness measurement already known under the product name EMG SOLID®, which can now also be used for measuring the layer thickness of insulating coatings on electrical sheet.

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Analysis

measurements require a high degree of technological competence, which must relate to a wide range of applications. Only a precise understanding of the specifics of the application and consideration of the accuracy requirements will result in a customised solution for the individual application. Laser measurement systems, for example, are easy to use and comparatively cost-

measuring system EMG iTiM iso works with different isotopes depending on the field of application and is used in both hot and cold processes. The flexible system design enables both single-point measurement systems and complex thickness profile measurements.

EMGiTiMxray

EMG iTiMxray uses the high-precision X-ray thickness measurement method. EMG

production line, which represents an economical alternative to more complex and costly system solutions, especially for steel and aluminium service centres and automotive lines.

Field of competence: retrofits and modernisations

The broad availability of a wide range of sensor technologies and EMG's extensive integration and application know-how enable the customer to realise a very economical

and efficient upgrade of existing systems by reusing system components during retrofitting and modernisation. By expanding the EMG product portfolio of quality assurance systems with the EMG iTiM thickness measurement solutions, the user receives a proven and reliable solution for precise

effective to purchase, but have physical limitations in terms of absolute measurement accuracy. Here the comprehensive solution expertise of the extended EMG team, based on decades of experience, comes into play. This is technologically reflected in the application spectrum of the EMG iTiM sensor family. [The EMG iTiM thickness measurement solutions](#) EMG iTiM iso The isotope radiation-based

iTiMxray can be used with a wide variety of materials due to the different generator voltages. From wafer-thin foils to thick strips. Here, too, single-point measurements and high-resolution thickness profile measurements are possible. EMG iTiM laser The EMG iTiM laser optical thickness measurement systems are characterised by low complexity, compact space requirements and flexible integration into the

measurement of strip thickness in a wide range of applications. Each installation is configured line-specifically and equipped with the appropriate combination and design of sensors for the specific application. In addition, customers worldwide benefit from EMG's existing international service network with personal expert advice directly on site. ■



Digitalization is the greatest transformational force of today's society, which has radically, fundamentally and globally changed the ways of society and will continue to do so. It affects how people interact and relate to each other, how we perceive things, how we take on tasks and how we find solutions. Digitalization leads to a transformation of society's most important elements - Growth, Innovation, Welfare, Sustainability and Security.

This situation provides opportunities as well as challenges for the Foundry Industry. To meet these challenges and create a sustainable future, we require knowledge through close collaboration between the various experts in society. The Institute of Indian Foundrymen, Kolhapur Chapter has felt the need to provide direction of this transformation, potential opportunities & challenges for growth through a well-defined roadmap which will help to effectively benchmark & cast our foundry industry to reach new levels of success in future through Digitalization.

'WESCON - 2022' a two day Conference is being arranged on **Sat. 15th & Sun. 16th Oct. 2022** at **Hotel Sayaji, Kolhapur**, with the theme '**Digitalization - New Era of Change**'.

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Former Executive Director,
Brakes India Ltd.
Chennai.

Key Note Speaker :



Mr. J. Ganesh Kumar
Managing Director
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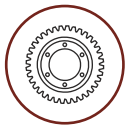


Mr. V. Srinivasa Reddy
Executive Director
Synergy Green Industries,
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IBAAS-JNARDDC 2022 Conference

The 10th IBAAS conference was inaugurated on 14th September morning by Mr. Bibhu Prasad Mishra, President & Head, Manufacturing Centre of Excellence, Hindalco Industries. Dr. Anupam Agnihotri, Director, JNARDDC, Ms. Marieke van der Mijn, Director of Partnerships, Aluminium Stewardship Initiative (ASI) and Ms. Lavanya Kugaswaran, Environment Program Manager, International Aluminium Institute (IAI), London were guests of honour. About 200 delegates, representing

bauxite, alumina and aluminium industry, research organisations, technology / equipment suppliers, service providers, and academic institutes participated in this conference. The inaugural function was conducted by Mr. Sankaranarayanan and Dr. Ashok Nandi, Convener of the Conference highlighted the journey, growth and contribution of IBAAS to Aluminium industry. Ms. Marieke of ASI highlighted the activities of their International organization, certification process and invited all the delegates to

participate in ASI workshop, which was held on 16th September at the same venue. Ms. Kugaswaran introduced the International Aluminium Institute and shown various publications on bauxite, alumina, red mud and aluminium available on their website. Dr. Agnihotri spoke on the responsibility and vision of Indian Aluminium industry, particularly with reference to celebration of 75 years of India's independence. According to Director, JNARDDC the demand of aluminium in India is expected to grow at 5-8% per annum and this will be driven

SYMPOSIUM 1



**MATERIALS &
PROCESSING**

SYMPOSIUM 2



**FAILURE
ANALYSIS**

SYMPOSIUM 3



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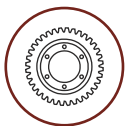
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Industry Update

by growth in sectors like electricity, transport, building, construction and packaging. The domestic Aluminium consumption is expected to double from ~4 MT in FY22 to ~8 MT in FY32.

The second day conference was devoted to series of technical papers in 3 parallel sessions namely Bauxite, Non-metallurgical bauxite-alumina and red-mud; Alumina and Aluminium Smelting and Downstream. About 50 high quality technical papers were presented by Engineers / Scientists of leading primary aluminium producers, R&D Institutes, technology and equipment suppliers. A complete list technical papers of IBAAS-JNARRDC 2022 is provided in the website and abstracts of all the papers are given in the Souvenir volume.

Important addition to this edition of the conference is the workshop by Aluminium Stewardship Initiative (ASI) on 16th September, which was held for the first time in India. Several interested delegates of primary and secondary aluminium producers of India participated in this program and discussed in detail about the ASI certification program and highlighted the benefits for responsible aluminium producers. At the same time some of the remaining technical papers of this conference on aluminium smelting and downstream were also parallelly presented. Three best papers of IBAAS-JNARRDC conference, presented by young scientists and engineers were awarded in the valedictory function on the end of third day.

On 17th September during this conference, JNARRDC as Metal Recycling Authority

organized one day brain storming session on Non-Ferrous Metal Recycling in India. In this vital meeting, Chief guest Mr. Ved Prakash Mishra of Ministry of Environment of Forest spoke about the importance of circular economy and aluminium recycling. Several representatives of MRAI (Material Recycling Authority of India), Bureau of Indian Standards, ASI and leading aluminium, copper, lead and zinc recycling companies participated and had intensive discussions on present status and future of this industry. JNARRDC is compiling detail report to these deliberation and discussion on recycling and same will be submitted to Govt. of India. On 18th September, the post-conference visit to Hindalco's Lapanga Smelter Plant in Jharsuguda was organized by IBAAS / HINDALCO for the selected foreign and Indian delegates.



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Material World- Shape of Things to Come: Bio-inspired Materials

In continuation of the articles covering advances in the field of metals, materials and minerals, and the directions which are shaping the field of material science, we have so far covered we have so far taken and overview, materials for batteries, technology for recycling and the rapidly evolving field of material informatics. Over the coming months, we plan to visit advances in 3D printing, nano-materials, the technical response to material nationalism among others. This month, we address the challenging area of bio-inspired and bio-mimetic materials and processes.

Mother Nature's physics, chemistry and engineering have created many unique materials with remarkable properties, with remarkable properties and examples abound! We will read about the examples of two such bio-materials which have inspired endless studies in material science and some



Spider-Silk: We have spider silk created by a mere insect, which shows an ultimate tensile strength of 1.75 GPa at a breaking elongation of 26%! In comparison, steel wire shows ultimate tensile strength of 0.42 GPa and OF 15%! The amino-acids in spider silk contain alanine and glycine and smaller proportions of serine and proline, arranged in various degrees of polymerisation. The structure determines the degree of crystallinity of the spider silk, which imparts unique properties such as three times toughness than aramid and most other industrial polymeric fibres! Compared to silkworm silk, it is more water resistant and can absorb three times the impact force without breaking! Unlike advanced melt extrusion processes used for polyesters and nylons, it has a high degree of transparency. Spider-silk is produced at ambient temperature (or spider's body temperature), without using an organic solvent, by the spider's *spinnerets* (silk spinning organs). The chemistry of the body proteins in spider's abdominal bodies contain normal and adhesive fluids, which harden into flexible yarn on getting into contact



Sadguru Kulkarni

Retired President- Technology, Hindalco Industries Ltd Corporate, covering Research & Technology, Technical. Now a Freelance Consultant in FMCG, Minerals & Metals, Chemicals and Sustainability

with air, (almost like *Loctite* or *Feviquick* of today). Spiders have organs called spinnerets at the tip of their abdomen in which silk and adhesive glands reside. Adhesive/ glue is added not to all silk, but to select fibres of some silk strands during extrusion, under the spider's control, almost like a co-extrusion process. Typical cross section of a spider-silk fibre is uniform & circular, unlike many manmade fibres which have varied, multi-lobed cross-sections. Some of us must have seen decades old spider webs, which indicate its resistance that the material offers to thermal attacks (more than 200 deg C), chemical stability (acid/alkali resistance), and bio-degradation.



With such remarkable properties, scientists have tried to emulate the material and processes for spider-silk. Material science departments in many international universities have set up research programs, covering multiple aspects, including reproducing the chemistry on



Technology

lab-bench; techniques for spidroin and non-spidroin protein fibre, aligning the process with synthetic polymers mainly polyurethane, creation of hydrogel, scaling the process for productivity with recombinant technology etc. Scientists say that within the coming half decade, practical applications of spider-like incorporation in clothing, shoes, upholstery and combat suits etc will get established. It is imperative that the learnings from the process of developing a nature-like material through biomimetic will lead to a number of spin-offs too.

A quick search shows that spider silk has been the subject of over 6500 papers & scientific publications and over 2700 patents covering synthesis, analysis, structure, properties and applications; which talk of the ever increasing importance of the material.

Hydroxyapatites: Another material with remarkable properties is hydroxyapatite, the calcium phosphate that makes the tooth enamel- the hardest tissue in our body. Unique properties of the tooth enamel are both due to its composition, Calcium to phosphorus ratio of 1.67, lattice structure described as $(Ca_{10})(PO_4)_6(OH)_2$, with the overall sand HA contains 39.68% by weight calcium and 18% by weight phosphorus. It ions the orientation of the morphologically aligned, parallel, ~50 nm wide, microns-long nanocrystals, bundled either into 5- μ m-

wide rods or their space-filling interred. The orientation of enamel crystals, however, is poorly understood. Here we show that the crystalline c-axes are homogeneously oriented in interred crystals across most of the enamel layer thickness. While multiple crystal forms of calcium phosphate occur, the hydroxyapatite form offers extreme stability under multiple conditions. Thermodynamically, hydroxyapatite is the most stable calcium phosphate compound under physiological conditions such as temperature, pH and composition of the body fluids, mechanical shock, permeability, as well as compatibility with the biological forms such as muscles, tissues, and nerves, also bacterial attack. No wonder human teeth can last over sixty years, with little damage, despite the regular interaction with a variety of food conditions, temperature, mechanical shocks etc. Whatever damage happens to the human tooth; it is often on account of associated muscle or cartilage problems.

Materials which have come a bit close in properties are the exoskeleton of molluscs and the shale of fish, which are crystal forms of calcium carbonate and calcium phosphates in various combinations. The organization of these building blocks is guided by proteins which act as the

crystal habit modifiers, and help in tight-pack alignment and orientation to minimize permeability.

No wonder such a material has been the subject of study of many papers, many of them published in Nature and attempts to mimic the hydroxyapatite synthesis for beneficial use has been the subject of many papers. In recent years, nanotechnology has been harnessed for this purpose. Nano-hydroxyapatite (nano-HAp) is attracting interest as a biomaterial for use in prosthetic applications due to its similarity in size, crystallography and chemical composition with human hard tissue, such as teeth enamel and bones. Use of hydroxyapatite powders generated through these processes are soon likely to get formulated into dentistry, bone treatment, as well as in development of novel ceramics.

A quick search indicates that there are more than 26000 patents and applications containing the term 'hydroxyapatite- covering synthesis, applications, analysis, structure and competing materials, which indicates the importance of the subject material.





Biomimetic gadgets and processes:

A well-known story goes how, in the early 1940s, Swiss engineer George de Mastral noticed the tendency of the fruit of the burr (*Xanthium strumarium*) to stick to dog's hair and used a microscope to observe the hooks on the fruit which attach to animal hair. He discovered that an elliptical fruit with a length of 1 cm had densely packed hook-like projections. These latched onto peoples' clothing or animals' hair, allowing seeds to be dispersed widely. This observation and the lateral thoughts finally lead to the novel design of velcro.

The success of Velcro has led many scientists and technologists to be fond of observing Mother Nature and emulating the principles behind natural wonders to create novel solutions; and published literature abounds with many examples. In fact, a journal of Biomimetics (with biomaterials and biomedical engineering) has been in print for last seven years; over twelve scholarly books have been published on the subject of biomimetics in last ten years; and there have been more than 10300 papers and 7700 conferences on the subject of biomimetics over last two decades. Some of the interesting topics covered are:

- Replicate centripade walk to facilitate robot movement. See how the

centipede's walk has been modeled and redesigned for a new technique for a mini-robot.



- Use the knowledge of the structure and function of lotus leaf to control surface wettability, for applications such as non-wetting textiles, coat for car windshield etc.
- Study of Extremophiles (such as bacteria in volcanic wells, deep sea environment, salinity tolerant algae and other plants), to impart superior corrosion and scratch resistance, etc.



- Draw clues from the superior ability of Geckos (Wall Lizard) to stick to any surface, even against gravity, through the secretion of a superior, reversible glue, to make one synthetically. This is now leading to the development of Gecko Glue, which is a pressure-

sensitive adhesive emulating the lizard's paws.

- Bio-computers- Highly compact information storage capacity of DNA and its coding-decoding tools has inspired the development of bio-computers, with two orders of magnitude higher speeds, lower power consumption and superior, long term performance.
- Feedback control, which is the key to evolution of all living beings, from amoeba and algae to humans, has been used extensively in technology for correction, control, and betterment. Smart materials are in fact based on this key for self-correction and self-improvement.
- Mother Nature is abounding with examples of using physics and chemistry diligently and innovatively to develop novel solutions which can revolutionize the material world. What is required is developing these observations into a science of biomimetic engineering. The recent advances indicate that this is feasible in near future.

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EU Energy: supply uncertainty grows on metal commodity

Energy security and supply concerns in Europe is heavily impacting the commodity market in the third quarter of 2022 after Russia restricted supplies in response to sanctions but these heightened tensions have been offset by a drop in recorded attacks on oil facilities, pipelines and tankers in the Middle East, the latest update of S&P Global Energy Security Sentinel research project showed.

Russia's war in Ukraine has been a major contributor to

the surge in geopolitical risk. Energy infrastructure and shipping has been disrupted in the war zone with pipelines, power plants and refineries targeted. The cost of shipping commodities like grains, metals and coal has fallen as soaring energy prices in Europe throttle global economic growth. Manufacturers of products such as aluminum and oils are curtailing production in Europe as the energy crunch makes operating plants too expensive. That's reduced the need for ships to

transport so-called dry bulk freight, according to Cargill Inc., the world's biggest agriculture trader, pulling down rates from their pandemic high. The uptick in disruptions to supply and energy security incidents around the Black Sea has been offset by a year-on-year decline in the number of attacks recorded in the Middle East in the third quarter. As per the News reports by S&P Global Commodity Insights show there have been 46 security incidents and attacks on energy and commodities infrastructure in the conflict



Analysis

zone since the war began.

According to analysis of reported incidents there was only one attack in the Gulf region, including Iraq, in the three-month period through to Sept. 26, compared with eight in the same period a year earlier.

This came as talks between Iran and international powers to revive the nuclear deal picked up, though a final agreement remains illusive. The investigation conducted by the Platts news team at S&P Global showed there were a total of 69 security incidents and attacks on energy infrastructure globally in the first nine months, a 156% increase from a year earlier.

"The oil market impact from the Ukraine war has highlighted the most important geopolitical shift for oil markets over the past decade," said Paul Sheldon, chief geopolitical advisor at S&P Global.

Sanctions introduced against Russia following its invasion of Ukraine have had a major impact on commodity supplies and continue to cause major price volatility. Sanctions have already reduced output from the world's largest producer of both oil and gas by approximately 2 million b/d. Russia has also restricted gas supplies to 12 European countries, triggering in some cases a 565% jump in prices year on year.

S&P Global forecasts that Russian oil disruptions will peak at 1.5 million b/d in the

first quarter of 2023, or 1 million b/d below the August average.

"We believe a sizable portion of the 3.5 million b/d of crude and product that needs to be re-routed from Europe will find buyers not requiring Western shipping services, with or without a price cap, but the policy could further ease the trade flow shift by permitting Western insurance under a certain price level," S&P Global analysts said.

Prices for Russian crude grades have also been affected. Platts, part of S&P Global, assessed Urals at \$62.735/b Sept. 23, compared with Dated Brent at \$85.285/b. Prior to the invasion, Urals was trading at a discount of around \$10/b to Dated Brent.

Meanwhile, natural gas prices in Europe have more than doubled, triggering a cost of living crisis and rampant inflation. The benchmark TTF month-ahead gas price has gained 563% in a year, putting economies and energy policymakers in the region under pressure.

"Our reference case assumes 13% of price-driven industrial gas demand destruction with only limited recovery post 2023," S&P Global added in a recent note. "Europe will have to secure large amounts of additional gas if the region is to avoid deeper and more permanent demand destruction."

Saudi attacks drop

Excluding Libya, the_Energy

Security Sentinel project showed incidents in the Middle East -- a traditional hotspot for geopolitical risk linked to oil and gas production -- had fallen sharply since the second quarter of 2022.

In the first quarter, the bulk of the attacks in the Middle East were focused on Saudi Arabia and the UAE while in Q2 Iraq took center stage, as tensions between Baghdad and Erbil spilled into some of the oil and gas fields located in the semi-autonomous region of Kurdistan.

Prior to the recent lull in attacks, the geographical range of security events was seen spreading across the Arabian Peninsula to the Strait of Hormuz and the east coast of the UAE. Since 2017, the Gulf of Oman, the Red Sea and the Bab al Mandab chokepoint have experienced the majority of maritime and onshore attacks. A total of 88 incidents have been verified and reported by Platts through June 30, 2022.

Overall, macro picture continues to weigh on the commodities complex and the hawkish FOMC meeting certainly hasn't helped. However, there are clear supply risks still facing the market following Putin's latest escalation.

In addition to the above, energy sentiment in the market remains negative following the US Federal Reserve rate hike and expectations that the Fed will be more aggressive in terms of tightening over the remainder of the year. This does add to a gloomier demand outlook.



Analysis

However, there are still clear supply concerns in the market. This was highlighted yesterday following Putin's announcement of a "partial mobilisation" and plans for sham referenda across parts of Eastern Ukraine. This is a clear escalation and raises concerns over what the implications could be for Russian energy flows. There is the potential that we see the West having to become more aggressive in terms of energy sanctions or the potential for Putin to weaponise energy even further. For natural gas, Russia has limited leverage

left, given that flows to the EU are down around 70% year-on-year. Where Russia has more leverage is oil, but even this will reduce in the coming months as the EU's ban on Russian oil and refined products comes into effect.

Metals: LME copper stocks jump by most since June. Base metals drifted lower ahead of the US rate hike decision, while a stronger US dollar put only further pressure on metal prices. Adding to the downbeat sentiment, Rio Tinto commented that copper's short-term outlook "might look a little bit challenged" as

decades-high inflation and snarled supply chains hit demand.

Meanwhile, copper inventories held in London Metal Exchange warehouses rose 10%, the biggest increase since 27 June. Large increases in metal immediately available to withdraw were seen in Europe, Asia and the US. Total stockpiles rose to 118,000 tonnes – the highest since August. On-warrant copper inventories increased 12% to 106,125 tonnes. The increase has put some pressure on spreads, with the cash/3M backwardation narrowing from US\$68/t to US\$59/t. ■

Hindalco switches on 25 MW solar plant for self-consumption



Hindalco's Mahan aluminum smelter unit in Madhya Pradesh now hosts a 25 MW solar plant to power its operations.

Aditya Birla Group company Hindalco Industries Ltd has commissioned a 25 MW captive solar power plant at its Mahan aluminum smelting unit in the Singrauli district of Madhya Pradesh. It will use the power generated for internal needs and aluminum production at the Mahan unit. The plant is expected to produce around 55 million units of electricity per annum.

Hindalco targets to become net-zero by 2050. It recently

signed a commercial arrangement with renewables developer Greenko to set up 375 MW to 400 MW of "captive" solar and wind power capacity. The project will supply power to its Aditya Aluminium smelter in Odisha.

Vedanta wins Golden Peacock Global Award for Excellence in Corporate Governance

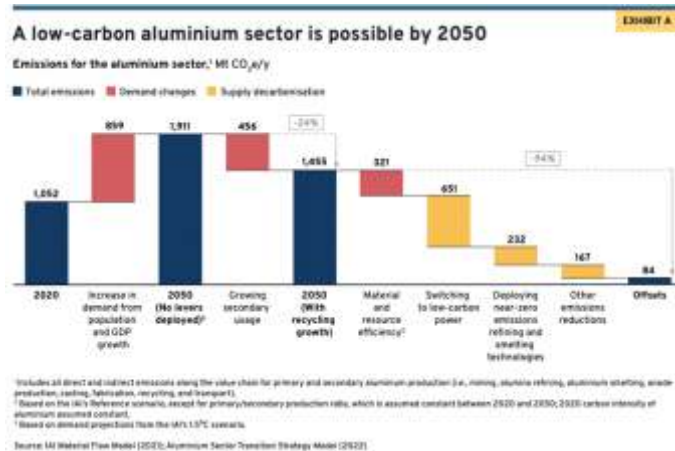
Vedanta has been bestowed with the Golden Peacock GLOBAL Award for Excellence in Corporate Governance - 2022 under the Metals and Metallurgy category. Golden Peacock Awards, instituted by the Institute of Directors (IOD) are regarded as a benchmark of Corporate Excellence worldwide. This is the third time the Company is being honored with this prestigious award.

"We believe this facility, apart from catering to the needs of the industry, will also magnify revenue generation opportunities and boost job creation," Rama Rao said, addressing the gathering after the ceremony.

Anil Chaudhry, Zone President (India) and CEO and MD of Schneider Electric India, said that the company would invest over ₹300 crore on this project.



ASI endorses mission possible partnership's strategy for Aluminium sector



The 'Mission Possible Partnership (MPP)'s Aluminium Transition Strategy is a plan that MPP underscores as ambitious but achievable, detailing what the global aluminium industry could look like in a zero-carbon world, and what is required to get there in terms of energy, infrastructure, financing, and policy.

Signatories to the report include ASI Members Alcoa, Aluminerie Alouette, Alumina Limited, Aluminium Association of Canada (AAC), Aluminium Dunkerque, Australian Aluminium Council, Ball, Companhia Brasileira de Alumínio, Constellium, Emirates Global Aluminium, European Aluminium, Hindalco Industries Ltd, Hydro, Novelis, and Rio Tinto.*

MPP's strategy deploys a combination of low carbon power, new technology for smelters and refineries, increased recycling and improving material efficiency to drive rapid decarbonisation, while also meeting increased demand over the coming decades.

Priority is given to early emissions reductions from adoption of low carbon power in this decade, while bringing to market the technologies to achieve deep decarbonisation in the following decades. Today, the sector accounts for about two percent of global emissions and four percent of electricity consumption. Matt Rogers, CEO of MPP said: "This Aluminium Transition Strategy is operationally relevant and industry-backed, not wishful thinking or pie in the sky. We know how to reduce emissions, initially deploying resources and technology available today. The imperative is to act now, in this decade: we're working with industry, supply chains and finance to deliver the clear thinking and asset-by-asset plans to make net zero viable".

Russia's largest copper deposit ready to start its production in 2023

Udokan Copper, a company developing Russia's largest copper deposit, is scheduled to start production in 2023 and is betting big on the Asian markets. Erkozha Akyzbek, the Chairman of Udokan Copper's board of directors and CEO of USM Holdings, its shareholder, spoke to ET's Dipanjan Roy Chaudhury about the details of the project and plans for India.

Udokan contains almost 27 million tons of copper resources. To put that figure into context, the market price for copper is now about \$7,700 per ton. This means that these volumes of copper could have a value of over \$200 billion once mined and processed.

At a full-scale production with regards to the considered expansion of Udokan volumes are set to reach 0.4 million tons per year.

Udokan is located in the Zabaikalye region in Russia's Far East. It's a sparsely populated region with winter temperatures falling as low as -60° Celsius. Soviet geologists compared its riches to the famous Copperbelt in Central Africa. However, the location's remoteness and geological complexity and lack of proper technology have been curbing the development.

After the world's renown investor and philanthropist Alisher Usmanov acquired the license to develop Udokan in 2008 with his partners, a combined production technology was developed to address this issue. At the moment the deal was the biggest one in the mining industry. Being a visionary Usmanov considered the project as a step to the sustainable future with perspective increasing demand for copper as a metal of new era.

India's Li-ion battery demand to grow to 70 GWh by 2030

India's Li-ion battery demand will grow from the current stage of 3 GWh to 20 GWh by 2026 and 70 GWh by 2030. This will need over \$10 billion to boost cell manufacturing and raw material refining to serve the local demand according to a report by Arthur D Little. Titled "E-Mobility: Cell Manufacturing in India", the report says that over 70 percent of the imports were from China and Hong Kong and subsequent actions were needed to reduce the dependency.

Prathmesh Choudhary, one of the lead authors of the report while speaking to Business Standard said that "unless and until we get control of the entire supply chain from the mines to the refining, we can't achieve an inventory". He said India has to acquire the mines in resource rich countries to maintain its supply like China. While EV cells are the most critical part of the e-mobility



value chain, the Indian EV industry suffers from overdependence on imports, limited local manufacturing, finite access to raw materials, and refining capacities. Large investments in R&D, supportive government policies, foreign direct investment inflows, and aggressive acquisition of raw material resources across geographies can help India achieve self-reliance in Li-ion batteries. The report further states that to thrive, Indian battery players should invest in collaborative R&D in advanced cell chemistries like sodium-ion, metal-air and designs that are safer, sustainable and economical in the Indian context and could be commercialized at a large scale. Global partnership, joint ventures and acquisitions can further boost capabilities and gain a robust talent edge. Prathmesh also said that the FAME subsidy for EVs is not feasible for the long term. According to the report, although the government's efforts such as FAME I & II policies and an increase in OEMs, traditional players, new-age start-ups venturing into battery manufacturing are gaining traction, they may not be enough to cater to the growing demand. It is necessary for Indian players to aspire for superior quality and environmental standards to gain eminent brand reputation, which will help India become self-sufficient in cells and position it as a global export hub.

Dr Andreas Schlosser, Partner, Global Head of Automotive, Germany said that India had a window of opportunity for the next 5-10 years to move in that direction before it became too late.

India mulls Rs20,000-cr aid to manufacture grid-scale batteries

India's power ministry is proposing a nearly \$2.5 billion incentive plan to encourage domestic manufacturing of grid-scale batteries, aiming at bringing down the cost of energy storage to speed up its energy transition. There are early-stage discussions in the government about offering incentives to manufacturers for batteries they produce over a certain time period, power minister

Raj Kumar Singh said in an interview last week. The total payout could be in the realm of 200 billion rupees, he said. Worried over rival China's dominance in lithium, the nation is in talks with countries including Australia to secure supplies of the battery metal, he said. India also plans to promote other battery technologies.

Lower storage costs will be key to providing around-the-clock renewable power supplies from intermittent renewable sources like wind and solar. Until that happens, India is prioritizing energy security, with plans to expand its coal power fleet by a quarter through 2030 unless



cheaper storage becomes available.

Large Indian conglomerates, including the Adani Group and Reliance Industries Ltd., have committed to investing billions of dollars in energy storage. The government plans to make developers bundle energy storage with future wind and solar projects to add capacity.

"I'm adding storage capacity because that will bring down costs. When enough volumes start getting added, the costs will come down," Singh said. "I'm not going to compromise on the availability of energy for our people and for the growth of our economy."

The battery plan would follow the blueprint of Prime Minister Narendra Modi's Make In India initiative. The government has offered financial incentives to spur domestic manufacturing of everything from solar panels to car batteries and electronics goods, in order to reduce dependence on imports and create local jobs.

ASK Chemicals inaugurates its new Mexican plant

ASK Chemicals celebrates the opening of its new production facility in El Carmen near Monterrey, Mexico, together with its employees. The new site will produce high-performance binders and coatings for the Mexican market.

With this investment, which is among the most significant in ASK Chemicals' history, the company is making a clear



commitment to the growing Mexican market. The site will be brought gradually into operation starting with the production of highperforming binders. The Coatings production will follow in the coming months. The newly inaugurated production facility will cover both current and future growth in the Mexican market. The new site represents an important addition to ASK Chemicals' manufacturing footprint in the Americas.

In addition to a state-of-the-art chemical plant, the new Monterrey site also houses development laboratories to bring the company's innovations closer to the Mexican market.

"The investment in our Mexican plant is one of the most significant for our company, and a fundamental milestone in our long-term strategy to better serve the Mexican market" states Frank Goede, Chief Executive Officer, "We are very proud of our team that has succeeded not only in building this world-class production site during a pandemic but also has transferred the know-how and expertise to ensure a smooth ramp-up."

ASI certifies second Novelis facility in China against performance standard

Novelis Aluminum (Zhenjiang) Co., Ltd. has achieved ASI Performance Standard V2 (2017) Certification at its rolling facility in the Jingkou Industrial Zone, Jiangsu Province, China. The plant produces high-strength structural plate products for aerospace and commercial plate applications.

Aluminium Stewardship Initiative (ASI) announced that Novelis has been successfully certified against the ASI Performance Standard at its Zhenjiang production facility in China. It is the second Novelis facility in China to receive Performance Standard Certification and its 19th certified facility globally.

The ASI Certification program was developed through an extensive multi-stakeholder consultation process and is the only comprehensive voluntary sustainability standard initiative for the aluminium value chain. The ASI Performance Standard defines environmental, social and governance principles and criteria, with the aim to address sustainability issues in the aluminium value chain. It sets out 59 criteria under the three sustainability pillars of Governance, Environment and Social, which address key

issues such as biodiversity, Indigenous Peoples rights, and greenhouse gas emissions.

The independent, third-party audit of Novelis' Zhenjiang plant was carried out by DNV Business Assurance Services UK Ltd.

"We sincerely congratulate Novelis on achieving Performance Standard Certification at its Zhenjiang rolling facility. Aluminium applications for the Aerospace sector must meet stringent operational performance requirements for strength, ductility, damage tolerance, and fatigue, among others. This ASI Performance Standard Certification demonstrates the company is also addressing the increasing global focus on the environmental, social and governance performance of aluminium production processes and operations.", Fiona Solomon, Chief Executive Officer at ASI.

"We are delighted that Novelis' Zhenjiang plant is now certified to meet ASI's environmental, social and governance standards. Driven by our purpose of Shaping a Sustainable World Together, we continuously dedicate ourselves to being the most trusted partner for our customers and to advancing the use of low-carbon, sustainable aluminum solutions to accelerate the transition to a circular economy in partnership with various stakeholders in China." – James Liu, Managing Director of Novelis China.

Hindustan Copper shareholders approve 23.2% dividend for FY22

The shareholders of Hindustan Copper Ltd (HCL) approved a 23.2 per cent dividend for the financial year ended in March 2022. The company would make a total dividend payout of Rs 112.17 crore as approved in the 55th Annual General Meeting, HCL said in a statement. During the meeting, HCL Arun Kumar Shukla said the production from the company's flagship project, Malanjkhand underground mine, has commenced. He also informed that the company has repaid a loan of Rs 729 crore in FY2021-22 from its internal accruals.

As the global economy moves toward net zero carbon emissions through the energy transition, the role of copper remains pivotal as the most efficient conductive material, indispensable for capturing, storing and transporting green energy, he said. Hence, a significant rise in demand for copper has been predicted on account of the thrust on a low-carbon economy, he added.



Hindustan Copper CMD expresses plans to increase mine production

To lessen the nation's reliance on imports, state-owned Hindustan Copper Limited (HCL) will gradually expand mine production of the metal to 20.2 million tonnes per annum (MTPA), a top business official announced on Wednesday.

The proposed expansion of the Malanjkhand Copper Project (MCP) in Madhya Pradesh will increase the copper ore production capacity from two MTPA to five MTPA by developing an underground mine beneath the existing open pit, whose life is nearing its end, HCL CMD Arun Kumar Shukla stated at the company's AGM in Kolkata. He claimed that due to its use in industries including electronics, construction, industrial machinery, and consumer goods, the demand for copper is anticipated to increase over the long term.

Additionally, according to Shukla, only 0.31% of the world's copper ore deposits are in India.

Only 0.1% of the world's mining production capacity comes from the country, while only 4% of the world's refined copper is produced there, he continued.

According to Shukla, phase one of the ore production expansion will take seven to eight years, after which it will be increased to 20.2 MTPA.

He claimed that due to the government's emphasis on infrastructure, defence, renewable energy, and electric vehicles, copper usage in India is predicted to increase significantly.

Production in the east will increase if mining operations at Ghatshila, Jharkhand, resume, he claimed.

Aluminum producers draw PM's attention to the coal shortage

The Aluminium Association of India (AAI) has sought the Prime Minister's urgent intervention for the immediate resumption of "sufficient" coal supplies to the domestic non-power sector.

As per AAI, an estimated 6,233 rail rakes, representing 25 million tonnes of coal, is owed as long-pending supplies to the non-power industries.

In a letter to the PMO, AAI highlighted that the challenges faced by the non-power sector continued despite significant improvements in Coal India's (CIL) production performance.

"Between April and July in FY23, CIL enjoyed a growth of 24% in production over the previous year, which encouraged the growth of 10% in the total supply from its reserves. This led to a 21% increase in CIL's supplies to the power sector," AAI said in the

letter. "However, during the same period, supplies to the non-power sector plummeted by 28%. The scenario persists due to continued prioritization of coal supplies to the power sector, to the detriment of several others," it added. "This is in spite of coal stocks greatly improving to over 13 days for the power sector," it further said.

The domestic non-power sector includes steel, cement, aluminium companies that are operating captive power plants. AAI said its members had been struggling to secure sufficient supplies of coal for their operations, with supplies continuing to plummet since August last year.

AAI said though several fuel supply agreements were already in place for meeting 100% of the requirements of the non-power sector, the overall materialization for the non-power sector had dropped to 55%, much below the trigger level of 75%, "while rail supplies are now almost non-existent."

"The aluminum sector is a continuous-process industry requiring a steady power supply. Any prolonged power interruption in an aluminium smelting operation for more than 2 hours can lead to the freezing of molten aluminium within the smelting pots, which takes almost a year to rectify and optimise, causing enormous production, cost and supply disruptions," AAI said in the letter.

"This has led the aluminium industry to collectively set up captive power plants of over 9,400 MW with an investment of over ₹50,000 crores. These captive power plants are larger in size, more efficient, located closer to coal pit heads, and could therefore better utilize the coal supplies from CIL," it added in the letter. It said forcing its members to draw power from the grid has led to cost escalation.

Vedanta champions 'Made in India' aluminium in Germany



Vedanta Aluminium, India's largest producer of aluminium, champions Made in India aluminium at the 'ALUMINIUM 2022' World Trade Fair in Düsseldorf, Germany. The company has put up its stall in Hall No. 6, Booth No. 64D5, at the tradeshow for displaying its top-of-

the-line product portfolio and manufacturing excellence to global customers.

"As India's largest producer of aluminium, it is a matter of pride for us to showcase our manufacturing expertise and product portfolio 'made in India for the world'. The forthcoming decades will see aluminium become the most-consumed metal in the world, given its ubiquity in current and potential clean technologies.

We, at Vedanta Aluminium, are on a relentless mission to deliver sustained growth for our customers, customers and country through aluminium, the metal of the future. This will see us leverage the full potential of our assets, deepen innovation capabilities, foster global partnerships, and develop new products and high-end alloys to cater to the emerging needs of a low carbon future." – Mr. Rahul Sharma, CEO – Vedanta Aluminium.

Since inception, Vedanta Aluminium has been a champion of national growth and development, putting India on the world map as a fast-emerging manufacturing powerhouse of aluminium and its products. With 2.3 million tonnes of installed aluminium smelting capability, Vedanta Aluminium produces a diverse array of standard and customised aluminium products that include billets, primary foundry alloys, wire rods, rolled products, and primary aluminium ingots.

The company is the first from India to supply low carbon aluminium, branded 'Restora' for discerning customers looking to source responsibly. Under Restora, the company offers two product lines – Restora (low carbon aluminium) and Restora Ultra (ultra-low carbon aluminium). Restora's greenhouse gas (GHG) intensity is well below the global threshold of low carbon aluminium (i.e., 4tCO₂e/t) and Restora Ultra has an even lower carbon footprint, which is near-zero. With Restora, Vedanta Aluminium's customers have the assurance that the aluminium they purchase has amongst the lower carbon footprints in the world.

The company's products find critical applications across a vast spectrum of industries such as automobile, construction, electrical, consumer goods and packaging, sunrise sectors such as electric vehicles and solar/renewable energy, and high-tech sectors such as aerospace and aviation. With a discerning client base in nearly 50 countries worldwide, Vedanta Aluminium proudly manufactures high quality aluminium made in India for the world.

Vedanta Aluminium, a business of Vedanta Limited, is India's largest producer of aluminium, manufacturing more than half of India's aluminium i.e., 2.26 million tonnes in FY22. It is a leader in value-added aluminium products that find critical applications in core industries.

Vedanta Aluminium ranks 4th in the Dow Jones Sustainability Index (DJSI) 2021 world rankings for aluminium industry, a reflection of its 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.

Russia's Rusal denies it plans to deliver aluminium into LME warehouses



Russia's Rusal said on Friday that speculation the aluminium producer was planning to offload metal into London Metal Exchange (LME) registered warehouses was misleading. The LME, the world's oldest and largest market for trading industrial metals, said on Thursday it was considering a consultation on whether Russian aluminium, nickel and copper should continue to be traded and stored in its system.

Rusal, the world's largest producer of aluminium outside China, has not been directly targeted by the Western sanctions imposed on Moscow after it sent thousands of troops to Ukraine on Feb. 24. But some market sources have said they were concerned that Rusal would not be able to sell its metal used in the transport, packaging and construction industries and would deliver it to LME warehouses instead. The suggestion "does not correspond to our physical sales, where we continue to service our global customers, including negotiating and planning 2023 offtakes," Rusal said.

Some buyers have said they are shunning Rusal's metal, while others are securing price discounts at the same time as the aluminium industry negotiates supply deals for 2023. The LME said no final decision had been taken on whether to issue a discussion paper to ask for views on Russian metal, but that it was under consideration.

"A discussion paper could also lay out potential options which could be pursued on the basis of market feedback gathered, including the option to take no action," Chief Executive Matthew Chamberlain said in the statement.

The LME did not detail the options that would be considered in a consultation. Rusal is expected to account for 6% of global aluminium supplies this year. Benchmark aluminium jumped 8.5% to \$2,305 a tonne on Thursday as the possibility of the LME banning new Russian metal from the list of brands that can be delivered against its contracts triggered a buying frenzy

China's spot copper premium to stay elevated as demand improves



The copper spot premium in top consumer China could stay elevated in the next few months, analysts and traders said on Friday, as demand for the metal has improved on the back of government stimulus.

The spot premium for refined copper was at 605 yuan (\$85.36) a tonne on Thursday, up from 50 yuan a tonne at the end of last year. Earlier this month, it hit 825 yuan, the highest since November 2021.

The premium, which is paid on top of copper prices listed on exchanges, gives an indication of the supply/demand balance in China's physical copper market.

China has in the past few months issued trillions of yuan worth of loans and spending on infrastructure, a heavy user of copper, as it seeks to revive its economy which has been battered by COVID-19 restrictions and a global economic slowdown.

"The Chinese commercial property market has been badly hurt especially for this year, but other sectors are looking good... the copper premium will still be at a relatively high level," said He Tianyu, China copper analyst at consultancy CRU Group.

Refined copper demand in China rose 5% year-on-year in the third quarter, and is seen accelerating to a 9% year-on-year growth in October-December, he said.

Average utilisation rates at copper wire-rod mills in China rose to 70% currently, from 62% at the beginning of August, and the rate at copper tube plants rose to 67%

from 64% during the same period, he added.

In manufacturing industry, another major copper consumer, official data showed September factory activity unexpectedly returned to growth after two months of contraction.

"The Chinese market has found support from improving demand, which contrasts with poor demand in non-Chinese markets and would keep the import arbitrage window open," a China-based metals trader said.

The Yangshan premium, which reflects demand for imported copper into China, rose to \$108 a tonne on Thursday, close to the \$112.50 level hit on Aug. 19, the highest since October last year. China's spot premium for refined copper is expected to stay elevated in Q4 China imported 2.37 million tonnes of refined copper in the first eight months of 2022, up 7.4% year on year, official data showed.

A Chinese copper tube maker expected more purchases after China's National Day holiday, which lasts from Oct. 1 to Oct. 7.

SUPPLY TIGHTNESS

Tight supply is also helping the premium.

Visible inventories in China, including metals in Shanghai Futures Exchange and China bonded warehouses, were at a record low of 118,697 tonnes combined.

Stockpile in ShFE and the London Metal Exchange warehouses together were 171,797 tonnes, equivalent to just 2.5 days of global consumption.

"Spot premium won't come down anytime soon as the supply in both domestic and overseas markets will remain tight," the metals trader said.

Graphic: China copper inventories in warehouses with visible data fall to historic lows

<https://fingfx.thomsonreuters.com/gfx/ce/myvmndkaep/copper%20inventories.png>

In August, Chinese copper cathode output fell short of expectation due to power curbs in Zhejiang and Anhui provinces, COVID-19 restrictions and tight scrap supply, state-backed research house Antaie said in a report on Sep. 9.

Supply disruptions due to liquidity issues at Maiké, China's top copper importer, also caused some tightness in the market, CRU's He said.

However, the market has remained volatile as a stronger dollar, helped by monetary tightening in the United States, could make copper more expensive to import and hurt the import premium, said another metals trader.

Peru proposes 'new approach' to mining to combat economic disparities, conflicts

Peru's government proposed "a new approach" for mining companies to end social gaps and avoid conflicts in the sector, a measure taken after several conflicts in the country in recent months.

Prime Minister Anibal Torres said during a conference between executives of large mining firms that the new "attitude" aimed to promote local and foreign investment. He added that the government of leftist President Pedro Castillo respects private initiative and wants to promote mining activity.

"Although the responsibility for closing gaps falls on the state, it is necessary to involve and commit mining companies to greater social investment," Torres said. Peru is the world's No. 2 copper producer and mining is vital for the country's economy, representing 60% of all exports. However, it has faced several conflicts and protests from local communities in its mining areas that ended up affecting mining operations. Companies affected include Grupo Mexico's Southern Copper Corp and MMG Ltd's Las Bambas.

The country's central bank forecasted in September that mining investment would fall 3.7% this year and the deepen in 2023 by 16.2%, with no new large projects in sight.

Poor indigenous communities have increased their demand for greater benefits for the exploitation of resources, creating blockades on roads and mining areas several times this year.

Torres's speech, at times applauded by mining executives, aims to calm down businessmen who have demanded a clearer reaction from the government to stop the protests. Among Torres' proposals is a "social fund" from mining companies for the development of their areas of influence, along with a federal multisectoral commission to improve the use of resources managed by the mining regions.

"Only in this way can we recover that social legitimacy and generate better conditions for the development of mining investments," he said, adding that national and foreign investors would have "full assurance" that their investments in Peru would be "safe."

Peru has planned investments of \$53 billion in mining projects, many of them frozen or delayed while they await environmental permits or social licenses from the communities of influence.

Schneider Electric to invest ₹300 cr in India on new facility



Schneider Electric, a digital transformation of energy management and automation solutions company based out of France, is setting up a Smart Factory at the GMR Industrial Park here.

Spread over 18 acres, the upcoming unit will be the company's second factory in Telangana. The new facility will be developed in two phases. The first phase, with a 2 lakh sqft area, will be completed in the next 12 months.

KT Rama Rao, Telangana IT and Industries Minister; Emmanuel Lenain, Ambassador of France to India; and Jayesh Ranjan, Principal Secretary to the Govt. of Telangana (IT and Industries), took part in the ground-breaking ceremony which was held recently.

Vedanta Lanjigarh-supported Shaktimayee group of women entrepreneurs completes 6 years



Vedanta Limited, Lanjigarh, India's premier producer of metallurgical grade alumina, recently observed the 6th Shaktimayee Foundation Day. The event celebrated the achievements of the Shaktimayee Foundation, a collective

of women Self-Help Groups (SHGs) supported by Vedanta Limited, Lanjigarh in partnership with the Mahashakti Foundation, an organisation working towards livelihood development among less-privileged groups.

Commencing operations in 2016, the Shaktimayee Foundation is today an enthusiastic group of nearly 4000 women entrepreneurs across the districts of Kalahandi and Rayagada. Formed under Vedanta's Project Sakhi, an initiative to empower women through skill training and livelihood generation opportunities, the group has helped spark social transformation through its member network. It focuses on helping its members establish market linkages to promote and sell their products, while guiding them in accessing social security services and institutional credit resources. Their efforts help promote social and financial inclusion, livelihood generation, and enterprise promotion.

As part of the Shaktimayee Foundation Day activities, Vedanta Lanjigarh organised several events, including the release of the Foundation's Annual Report FY21-22, awarding best-performing SHGs, and recognising individual members who had successfully built income generation projects. The group's members also collectively brainstormed on its way forward and possible new projects.

Commending the members of Shaktimayee Foundation, Mr. GG Pal, Dy. CEO – Alumina Business, Vedanta Limited, said, "Through the Vedanta Sakhi project, we are expanding the income creation avenues available to women in Lanjigarh and its surrounding areas, in line with the UN Sustainable Development Goals of Gender Equality, Reduced Inequalities, Decent Work & Economic Growth, and Sustainable Communities. By aiding rural women in establishing themselves as income generators within their own households and shared neighbourhoods, Vedanta Lanjigarh enables them to become equal stakeholders in the development of their communities." Shri. Maheshwar Das, District Development Manager – NABARD, Kalahandi, said "Building a sustainable ecosystem for women entrepreneurs to thrive, and enabling them with the diverse tools to succeed, is the key to creating self-sustaining rural communities. Initiatives such as Vedanta Sakhi greatly reinvigorate the pace of socio-economic activity and growth in rural areas, enabling them to be identified as independent job creators rather than merely labour sources for urban areas.

Smt. JasodaBehera, President, Shaktimayee Foundation, also expressed her gratitude, saying "Our members comprise of hardworking women who only need the right opportunities to demonstrate their infinite capabilities. The ability to earn an independent income and contribute to their family's socio-economic wellbeing is an enormous confidence booster. Vedanta, with its consistent commitment to empowering our members with lasting skills over the past six years, has demonstrated great dedication to the sustainable wellbeing of rural women."

Vedanta Lanjigarh's developmental interventions are aimed at improving the quality of life of local communities. Together, they help positively impact the lives of over 25000 people in Lanjigarh and its surrounding areas. Vedanta Lanjigarh's women-focused initiatives have helped drive the socio-economic transformation of the areas surrounding its operations. One such initiative, Vedanta NandGhar, reimagines anganwadis as community hubs for women and child development, and is creating new avenues and growth opportunities for community members through comprehensive skill development programs and livelihood training sessions.

Vedanta Aluminium, a business of Vedanta Limited, is India's largest producer of aluminium, manufacturing half of India's aluminium i.e., 2.26 million tonnes in FY22. It is a leader in value-added aluminium products that find critical applications in core industries. Vedanta Aluminium ranks 4th in the Dow Jones Sustainability Index (DJSI) 2021 world rankings for aluminium industry, a reflection of its sustainable development practices. The company operates a 2 MTPA (million tonnes per annum) capacity alumina refinery in Lanjigarh (Kalahandi district, Odisha), India since 2007 and an associated 75 MW captive power plant. 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.



Statistics

SIAM appoints Mr Vinod Aggarwal as its new President

The Executive Committee of Society of Indian Automobile Manufacturers (SIAM), the apex body of the Indian automotive industry, today elected Mr Vinod Aggarwal, MD & CEO, Volvo Eicher Commercial Vehicles Ltd (VECV) as its new President for 2022-23.

Mr Vinod Aggarwal, who was the Vice President of SIAM succeeds Mr Kenichi Ayukawa, Executive Vice Chairman & Whole Time Director, Maruti Suzuki India Ltd.

The election for new office bearers was conducted during the Executive Committee Meeting, which was held after SIAM's Annual General Meeting today.

After taking over as SIAM President, Mr Aggarwal



said, "The Indian automotive industry is currently at a very exciting juncture. The industry is witnessing rapid adoption and focus on connectivity, e-mobility and alternate fuels, and other technological advancements, to provide the consumers with not just modern, but also safe and environment friendly vehicles. We are grateful to the government for its constant focus on improving the infrastructure through significant investments and such policies that modernise this industry. I am humbled by the opportunity to contribute to the new era of Amrit Kaal, working closely together with the SIAM members."

The members of SIAM also elected Mr Shailesh Chandra, Managing Director, Tata Motors Passenger Vehicles Ltd and Tata Passenger Electric Mobility Ltd, as the Vice President of SIAM for 2022-23.

Mr Satyakam Arya, CEO & MD, Daimler India Commercial Vehicles was elected as the Treasurer of SIAM for 2022-23.

Society of Indian Automobile Manufacturers

Monthly Performance: August 2022

Production: The total production of Passenger Vehicles*, Three Wheelers, Two Wheelers and Quadricycle in the month of August 2022 was 2,275,407 units.

Domestic Sales:

Passenger Vehicles* sales were 281,210 units in Aug 2022.

Three-wheeler sales were 38,369 units in August 2022.

Two-wheeler sales were 1,557,429 units in August 2022.

Performance: April - August 2022

Production: Total production of Passenger Vehicles**, Three Wheelers, Two Wheelers and Quadricycle in April-August 2022 was 10,542,675 units.

Domestic Sales:

Passenger Vehicles** sales were 1,485,506 units in April-August 2022

Three-wheeler sales were 145,986 units in April-August 2022

Two-wheeler sales were 6,663,265 units in April-August 2022

** BMW, Mercedes, Tata Motors & Volvo Auto data is not available*

*** BMW, Mercedes & Volvo Auto data is not available, Tata Motors data is only available for Apr-Jun*



Society of Indian Automobile Manufacturers

Commenting on the August 2022 sales data, **Mr Rajesh Menon, Director General, SIAM** said *“In August 2022, sales in the Passenger vehicle segment stood at 2.8 lakh units, Two-wheelers posted sales of 15.6 lakh units, while Three-wheeler segment posted sales of just 38,000 units. While good monsoon and the upcoming festive season is likely to increase demand, SIAM is keeping a close watch on the dynamic supply-side challenges. High CNG prices is a big challenge for the industry and we keenly look forward to the kind interventions and support from the Government.*

Domestic Sales: August

Category	Domestic Sales (In Nos.)	
	August-21	August-22
Passenger Vehicles (PVs)*		
Passenger Cars	108,508	133,477
Utility Vehicles (UVs)	112,863	135,497
Vans	10,853	12,236
Total Passenger Vehicles (PVs)	232,224	281,210
Three Wheelers		
Passenger Carrier	15,045	29,105
Goods Carrier	7,773	7,007
E-Rickshaw	746	2,095
E-Cart	42	162
Total Three Wheelers	23,606	38,369
Two Wheelers		
Scooter/ Scooterette	460,284	504,146
Motorcycle/Step-Throughs	825,849	1,016,794
Mopeds	52,607	36,489
Total Two Wheelers	1,338,740	1,557,429
Quadricycle	3	64
Grand Total	1,594,573	1,877,072

* BMW, Mercedes, Tata Motors & Volvo Auto data is not available.



Domestic Sales: April-August

Category	Domestic Sales (In Nos)	
	April-August-21	April-August-22
Passenger Vehicles (PVs)**		
Passenger Cars	575,779	688,440
Utility Vehicles (UVs)	523,012	737,159
Vans	44,147	59,907
Total Passenger Vehicles (PVs)	1,142,938	1,485,506
Three Wheelers		
Passenger Carrier	41,118	102,195
Goods Carrier	23,266	35,020
E-Rickshaw	1,755	7,476
E-Cart	121	1,295
Total Three Wheelers	66,260	145,986
Two Wheelers		
Scooter/ Scooterette	1,438,270	2,191,208
Motorcycle/Step-Throughs	3,403,323	4,292,050
Mopeds	170,895	180,007
Total Two Wheelers	5,012,488	6,663,265
Quadricycle	5	218
Grand Total	6,221,691	8,294,975

** BMW, Mercedes & Volvo Auto data is not available, Tata Motors data is only available for Apr-Jun

SIAM						
Segment wise Comparative Production, Domestic Sales & Exports data for the month of August 2022						
Category Segment/Subsegment	Production		Domestic Sales		Exports	
	August		August		August	
	2021	2022	2021	2022	2021	2022
Passenger Vehicles (PVs)*						
Passenger Cars	126,252	160,708	108,508	133,477	32,245	30,409
Utility Vehicles (UVs)	129,965	160,643	112,863	135,497	18,802	24,280
Vans	10,531	12,133	10,853	12,236	149	44
Total Passenger Vehicles (PVs)	266,748	333,484	232,224	281,210	51,196	54,733
Three Wheelers						
Passenger Carrier	50,351	71,509	15,045	29,105	36,286	43,930
Goods Carrier	9,347	7,116	7,773	7,007	629	236
E-Rickshaw	694	2,233	746	2,095	-	-
E-Cart	40	178	42	162	-	-
Total Three Wheelers	60,432	81,036	23,606	38,369	36,915	44,166
Two Wheelers						
Scooter/ Scooterette	498,178	552,540	460,284	504,146	34,496	45,578
Motorcycle/Step-Throughs	1,111,939	1,270,903	825,849	1,016,794	336,979	258,048
Mopeds	57,510	37,314	52,607	36,489	858	66
Total Two Wheelers	1,667,627	1,860,757	1,338,740	1,557,429	372,333	303,692
Quadricycle	535	130	3	64	744	102
Grand Total	1,995,342	2,275,407	1,594,573	1,877,072	461,188	402,693
* BMW, Mercedes, Tata Motors and Volvo Auto data is not available						
Society of Indian Automobile Manufacturers (09/09/2022)						



SIAM						
Summary Report: Cumulative Production, Domestic Sales & Exports data for the period of April-August 2022						
Report I						(Number of Vehicles)
Category	Production		Domestic Sales		Exports	
Segment/Subsegment	April-August		April-August		April-August	
	2021-22	2022-23	2021-22	2022-23	2021-22	2022-23
Passenger Vehicles (PVs)*						
Passenger Cars	737,088	851,603	575,779	688,440	146,537	170,448
Utility Vehicles (UVs)	618,476	843,291	523,012	737,159	83,321	98,096
Vans	45,212	60,177	44,147	59,907	740	525
Total Passenger Vehicles (PVs)	1,400,776	1,755,071	1,142,938	1,485,506	230,598	269,069
Three Wheelers						
Passenger Carrier	255,082	275,086	41,118	102,195	215,338	177,642
Goods Carrier	29,145	37,329	23,266	35,020	4,156	1,842
E-Rickshaw	1,532	7,214	1,755	7,476	-	-
E-Cart	120	1,300	121	1,295	-	-
Total Three Wheelers	285,879	320,929	66,260	145,986	219,494	179,484
Two Wheelers						
Scooter/ Scooterette	1,634,304	2,381,230	1,438,270	2,191,208	158,392	192,844
Motorcycle/Step-Throughs	5,058,696	5,904,931	3,403,323	4,292,050	1,722,162	1,615,830
Mopeds	174,248	179,697	170,895	180,007	6,152	1,110
Total Two Wheelers	6,867,248	8,465,858	5,012,488	6,663,265	1,886,706	1,809,784
Quadricycle	2,585	817	5	218	2,795	642
Grand Total	8,556,488	10,542,675	6,221,691	8,294,975	2,339,593	2,258,979
* BMW, Mercedes, Volvo Auto data is not available and Tata Motors data is available for Apr-June only						
Society of Indian Automobile Manufacturers (09/09/2022)						

SIAM												
Category & Company wise Summary Report for the month of August 2022 and Cumulative for April-August 2022												
Report II												(Number of Vehicles)
Category	Production				Domestic Sales				Exports			
Segment/Subsegment	August		April-August		August		April-August		August		April-August	
Manufacturer	2021	2022	2021-22	2022-23	2021	2022	2021-22	2022-23	2021	2022	2021-22	2022-23
Passenger Vehicles (PVs)												
FCA India Automobiles Pvt Ltd	1,661	1,636	6,544	8,492	1,173	1,321	4,192	6,248	506	435	2,699	1,933
Force Motors Ltd	7	68	7	351	-	52	-	348	-	-	-	1
Ford India Private Ltd	10,632	NA	39,337	NA	1,508	NA	15,818	NA	6,012	NA	18,022	NA
Honda Cars India Ltd	12,673	9,935	39,424	48,512	11,177	7,769	33,103	38,449	2,254	2,356	5,736	10,993
Hyundai Motor India Ltd	56,100	61,900	259,500	296,100	46,866	49,510	209,407	235,305	12,202	12,700	54,290	60,571
Isuzu Motors India Pvt Ltd	183	155	554	1,440	73	45	293	250	1	-	51	194
Kia Motors India Pvt Ltd	21,063	31,026	93,331	146,188	16,750	22,322	73,942	106,105	4,020	8,174	19,661	37,630
Mahindra & Mahindra Ltd	16,518	32,047	88,228	135,115	15,973	29,852	80,221	134,215	943	717	3,917	3,495
Maruti Suzuki India Ltd	111,368	156,041	640,443	790,174	103,187	134,166	529,981	646,170	20,268	21,382	86,327	110,372
MG Motor India Pvt Ltd	2,981	3,933	15,877	19,885	4,315	3,823	15,679	18,355	-	-	-	-
Nissan Motor India Pvt Ltd	6,244	9,858	32,161	40,290	3,209	3,283	15,575	14,706	889	5,633	12,710	21,725
PCA Motors Pvt. Ltd	84	930	507	1,675	61	850	412	1,577	-	-	-	-
Renault India Pvt Ltd	10,477	9,691	46,013	49,095	9,703	7,012	36,852	36,061	664	2,220	6,945	12,518
SkodaAuto India Pvt Ltd	3,452	3,832	10,335	26,098	3,829	4,222	9,320	24,448	-	-	-	-
Tata Motors Ltd*	NA	NA	70,492	131,375	NA	NA	64,961	131,940	NA	NA	345	222
Toyota Kirloskar Motor Pvt Ltd	9,170	9,316	27,189	42,438	12,769	14,939	44,998	76,053	19	-	22	45
Volkswagen India Pvt Ltd	4,135	3,116	30,834	17,843	1,631	2,044	8,184	15,276	3,418	1,116	19,873	9,370
Total Passenger Vehicles (PVs)	266,748	333,484	1,400,776	1,755,071	232,224	281,210	1,142,938	1,485,506	51,196	54,733	230,598	269,069
* Only cumulative data is available for Apr-June NA= Not Available												

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Category & Company wise Summary Report for the month of August 2022 and Cumulative for April-August 2022												
Report II												(Number of Vehicles)
Category	Production				Domestic Sales				Exports			
Segment/Subsegment	August		April-August		August		April-August		August		April-August	
Manufacturer	2021	2022	2021-22	2022-23	2021	2022	2021-22	2022-23	2021	2022	2021-22	2022-23
Three Wheelers												
Atul Auto Ltd	1,528	1,924	4,707	9,193	1,222	1,658	4,014	7,781	189	292	441	1,274
Bajaj Auto Ltd	34,459	44,944	174,844	167,557	14,621	22,853	40,245	79,689	19,592	22,951	137,171	91,525
Continental Engines Pvt Ltd	324	633	618	2,833	396	567	786	2,774	-	-	-	-
Force Motors Ltd	350	278	1,355	1,072	-	-	-	-	462	406	1,400	1,106
Mahindra & Mahindra Ltd	2,141	5,123	9,088	19,892	2,591	4,793	7,804	19,806	-	95	144	192
Piaggio Vehicles Pvt Ltd	5,893	10,943	23,034	43,038	4,008	7,147	11,320	30,355	1,059	3,525	10,864	11,743
TVS Motor Company Ltd	15,737	17,191	72,233	77,344	768	1,351	2,091	5,581	15,613	16,897	69,474	73,644
Total Three Wheelers	60,432	81,036	285,879	320,929	23,606	38,369	66,260	145,986	36,915	44,166	219,494	179,484
Two Wheelers												
Ather Energy Pvt. Ltd	2,107	6,611	5,874	19,921	2,117	6,441	6,269	19,706	-	-	-	-
Bajaj Auto Ltd	326,322	343,146	1,515,895	1,519,910	157,971	233,838	656,755	712,640	180,339	121,787	911,429	805,197
Hero MotoCorp Ltd	421,375	470,003	1,946,959	2,266,391	431,137	450,740	1,801,052	2,209,590	22,742	11,868	131,732	88,790
Honda Motorcycle & Scooter India Pvt Ltd	467,918	470,557	1,392,305	2,002,143	401,480	423,226	1,233,239	1,821,100	30,114	39,307	157,008	182,902
India Kawasaki Motors Pvt Ltd	97	196	1,182	886	298	283	1,229	1,318	-	-	-	-
India Yamaha Motor Pvt Ltd	77,664	83,227	273,334	386,572	54,042	58,659	172,527	254,299	22,965	30,689	116,132	135,388
Mahindra Two Wheelers Ltd	-	-	-	72	3	23	3	83	-	-	-	-
Okinaawa Autotech Pvt. Ltd	5,227	13,746	16,687	56,289	5,187	13,708	17,075	56,452	40	38	113	78
Piaggio Vehicles Pvt Ltd	9,533	6,187	32,047	29,846	5,500	3,548	17,412	20,877	3,375	1,664	14,126	8,000
Royal-Enfield (Unit of Eicher Motors)	22,103	73,084	200,310	344,531	39,070	62,892	183,037	267,063	6,790	7,220	30,501	45,809
Suzuki Motorcycle India Pvt Ltd	64,231	83,566	283,974	362,307	61,809	64,654	239,264	293,320	11,654	14,905	53,974	74,000
Triumph Motorcycles India Pvt Ltd	59	55	294	266	127	92	575	445	-	-	-	-
TVS Motor Company Ltd	270,991	310,379	1,198,387	1,476,724	179,999	239,325	684,051	1,006,372	94,314	76,214	471,691	469,620
Total Two Wheelers	1,667,627	1,860,757	6,867,248	8,465,858	1,338,740	1,557,429	5,012,488	6,663,265	372,333	303,692	1,886,706	1,809,784
Quadricycle												
Bajaj Auto Ltd	535	130	2,585	817	3	64	5	218	744	102	2,795	642
Total	535	130	2,585	817	3	64	5	218	744	102	2,795	642
Grand Total	1,995,342	2,275,407	8,556,488	10,542,675	1,594,573	1,877,072	6,221,691	8,294,975	461,188	402,693	2,339,593	2,258,979
Society of Indian Automobile Manufacturers (09/09/2022)												

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HIGHLIGHTS OF MBD-2022

- **CONFIRMATION FROM MORE THAN 30 MINERAL COMPANIES OF INDIA AND ABROAD**
- **TECHNICAL DELIBERATIONS UNDER INDUSTRIAL MINERALS, FERROUS & NON-FERROUS MINERALS, WASTE UTILIZATION & EMERGING AREAS**
- **MORE THAN 40 ABSTRACTS RECEIVED SO FAR**
- **SPECIAL TECHNICAL SESSION ON REE BY LEADING EXPERTS**
- **EXHIBITION OPPORTUNITIES FOR EQUIPMENT MANUFACTURERS, TECHNOLOGY SUPPLIERS AND MINERAL PRODUCERS**
- **EXCELLENT OPPORTUNITY TO MEET MINING COMPANIES AND MINERAL PRODUCERS**



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