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Vol. 21 No. 10

October 2022

Registered-RNI No. MAHENG/2002/7908

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**Copper recycling
to minimise the
raw material
dependency**

Divya Pandya,
General Manager
Rashtriya Metal Industries

**Wescon 2022
Digitalization in the Indian Foundries
will set a benchmark**

**3D Printing -
A new era in material science**

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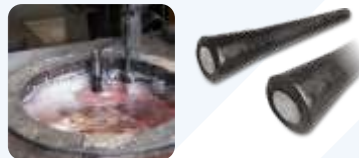
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D. A. Chandekar Editor

Dear Readers,

While almost all the global financial experts are sure about recession being just round the corner, many of them are also sure about recession not much denting the Indian economy. Why everybody is so sure about the recession ? Why it is hitting most of the world and not India ?

As we all know, since 2020, the whole world was under the attack of deadly virus and the pandemic continued till the end of 2021. During this period, everybody suffered financially, whether you are a businessman, or an employee, or a self employed person, your wealth eroded. The professional activity suffered a lot due to frequent lockdowns and the destruction of supply chain and logistics which followed thereafter. Many small business houses could not sustain this challenging period and had to pull down the shutter permanently. Big enterprises somehow managed to remain afloat but they too had to digest the big loss. By the end of 2021 and start of 2022, the business community had come out of this jolt mentally (if not financially) and was looking forward to a bright fortune in 2022. All these expectations were shattered due to sudden erupting of Russia – Ukraine war. Further everybody thought it was a short time affair but prolonging of this war also had a huge negative contribution to

Editorial Desk



the world economy. This is now followed by a deep devaluation of the currencies across the world affecting the transactions all over. All these factors, pandemic as well as the war and their unfortunate fallouts, substantially reduced the purchasing power and ability of the common consumer and the recession seems to be the natural consequence, a certainty !

Let us now understand India's position. It is a consumption and demand driven economy. A big population of 135 crores and the biggest middleclass in the world ensures continuous demand of almost everything. It may fluctuate to some degree because of inflation and price trends but the continuity is well maintained. Further, India's overseas trade has always been very small in percentage and that is the reason we have been saved from the financial crisis of 1998 and also global (actually western world) meltdown in 2008. To say so, India is somewhat immune to the tremors of the faultlines developed in the global economy. This is the reason why India is likely to be the least recession hit country.

Friends, metallurgical industry would play a big role in saving the country from the recession. Today the focus of Indian economy is infrastructure development and this process consumes metals on a big scale. Our industry has a great responsibility to make the metals available at the right time and at the right price so that the infra development process gets a boost. Hope our industry rises to the occasion and India is never required to face the recession !

Write your comments :

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Copper recycling to minimise the raw material dependency

Divya Pandya, General Manager at Rashtriya Metal Industries responsible for Raw Material Procurement. She has an Engineering Degree in Metallurgy.

The demand for copper which is expected to grow over the next three decades, with some estimates suggesting that the annual demand from clean energy technologies will reach over \$400 billion by 2050. While global copper mine production during the year 2022 would surge by 3.9% as per ICSG.

Global copper inventory in LME and Shanghai Metal Exchange is depleting in short term with the markets running with inventories cover of 4.9 days of global consumption (End of year forecast is 2.7 days). As a

result, Copper prices have been volatile since the beginning of the year. After hitting \$10,000 per ton mark in the first quarter they have never seen those levels due to the global pressure of economic uncertainty related to inflation and weak demand from China.

Looking at such volatile copper market, D A Chandeka had an exclusive interaction with Divya Pandya, GM, Rashtriya Metal Industries to understand the present status of copper industry, demand-supply pattern, expectation from the

policymakers and how semi-finished and finished copper products from FTA countries import had an impact on the domestic copper manufactures etc.

Excerpts :

What is the present status of copper industry in the country? Especially in your product range?

Government's thrust on decarbonisation through Circular Economy and Recycling is a good booster to the Copper industry. With Indian industry poised to become a manufacturing intensive industry, Copper demand is on an upward trajectory.

Despite the projected rise, the scrap recycling sector faces several challenges, some of which can be addressed by

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Face to Face

increased investment in capital equipment and technology, while an active role by governments will be crucial to the copper sector's impact on decarbonization.

Moreover, new guidelines on the global trade of copper scrap could push domestic industries to invest in the copper secondary market while also creating new recycling hubs.

Copper is key to electric vehicles, wind and solar power, as well as the infrastructure that transports and stores renewable energy. Green initiatives of government like EVs and Solar cells consume huge amounts of copper. Other renewable energy technologies also consume greater amount of copper than the conventional resources. For example, Electric vehicles contain approximately four times more copper than conventional cars. Copper is used in Batteries, Windings and copper rotors used in electric motors, wiring, bus bars etc.

Thus demand for copper and copper alloy products is good and is expected to improve further.

How do you analyse the copper market in the near-term?

Copper market is definitely growing. Locally, demand for both secondary and primary copper raw material as well as finished goods is good. Internationally, with thrust on green energy, e-vehicles,

digitalization etc we expect increase in global demand.

Increasing copper recycling from end-of-life products and process-generated scrap offers a sustainable pathway toward reducing global dependence on primary ore in a context of rising copper end-use demand. With desirable properties, mainly related to electrical conductivity, copper is used in multiple applications and sectors, and is one of the few materials that can be repeatedly recycled without a loss in performance.

Macroeconomic picture seems gloomy with talks of recession in US, UK & EU, droughts and political unrest in South American countries. But the stock level of copper at LME warehouses and in China's bonded warehouse are extremely low. These needs to be replenished. Therefore, demand will bounce back. However, any slight uptick in demand is expected to fuel a price surge in Copper.

In the local market the divergence of primary smelters partly to secondary raw material will result in challenges in sourcing secondary copper scrap.

The new copper smelter in Gujarat is expected to start production next year, this will boost demand for both concentrate and scrap.

How do you see the export market for copper products?

Commerce Ministry has set a target of 2 trillion worth of exports by 2030. Copper being a bellwether product for any economy, Copper products cannot be left behind in the race.

After the pandemic, internationally countries have developed (China+1) policy for their Supplies. Indian is an obvious choice for this "+1".



The energy crisis in EU has caused closure of several metal factories. Indian producers are taking advantage of this slowdown in EU to boost their exports.

What help does the copper industry need from the policy makers?

Various government departments are actively



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interacting with industry players to address their issues. This is a very commendable approach. However, we would not want policy makers to blindly emulate and implement rules and regulations of other countries in India. For example, in case of copper scrap, some policy makers were of the opinion that just like China had banned import of scrap, citing pollution as a reason, so India must also ban all imports of copper scrap. After several rounds of discussions, we have observed a change in this thought process.

Industry expects better logistics infrastructure, better port management and enhancement of ease of

doing business through digitalization.

India imports huge quantity of copper finished and semi-finished products from the FTA Countries. Does this harm the domestic market?

FTAs/ CEPAs should be looked at positively. FTAs/ CEPAs help to mitigate material shortages and bring in competition in finished goods. Industry must accept the challenge of competing with international players. Today raw material like scrap are not included in FTAs, but for the forthcoming India-UAE FTA, I would urge government to include Copper scrap in it. Huge amount of copper scrap is imported from UAE. India can propose to import this

scrap duty free under FTA and sell the finished product in same market. This can be a win-win situation. For this the existing FTA structure needs to be relooked.

To protect domestic industry against imports of cheap products under FTA/CEPA, government is giving due cognisance to industry's concerns. A good example is the imposition of countervailing duty on imports of "Copper Tubes and Pipes" from Malaysia, Thailand and Vietnam this year. Therefore, by following FTA/CEPA little cautiously, industry can stand to gain by it. ■



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Feature



Wescon 2022

Digitalization in the Indian Foundries will set a benchmark

Digitalization is the greatest transformational force of today's society, which has radically, fundamentally and globally changed society and continues 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 & 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 and 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. In view of this IIF Kolhapur Chapter jointly with IIF-WR organized a Two Day Conference 'WESCON - 2022' on 15th & 16th October 2022.

During Wescon-2022 around 350 delegates representing various layers of management in foundries located in Western India & the other parts of the country were benefited by eleven Keynote presentations made by eminent speakers, renowned industry experts who are early adopters of technology and culture thought leaders on different important topics concerning on the theme of conference.

The conference was inaugurated on 15th April 2022 by Mr. Basavaraj

Kalyani, Executive Director, Bharat Forge, Pune as a Chief Guest, in presence of J. Ganesh Kumar, MD, Indoshell Cast Pvt. Ltd., Coimbatore as a Keynote Speaker & Mr. V. Narasimhan, Former Ex. Director, Brakes India Pvt.Ltd. Chennai as a Guest of Honor.

The 1st session on 15th April



starts with a fine presentation on 'Need for Digitalization- in Foundry Industry' by Vijay Menon, MD, Menon & Menon Ltd., Kolhapur. Then a paper on 'A strategic roadmap to Digitalization' by Milind Kank, MD, Yeshshree Press Comps. P.L. Aurangabad and later a Presentation by Platinum Sponsor Vedanta Limited. The session was chaired by Prasad Mantri, Mantri Metallics Pvt. Ltd., Kolhapur.

The 2nd session after lunch



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Feature



consisted of three papers, first by Mukund Kulkarni, Director, Expert Global Solutions, Aurangabad on 'Digitalization for Operational Excellence'. Second paper on 'Delegation - The Hidden Magic key to Business Growth' by Rajendra Nageshkar, Former VP, ThyssenKrupp, Pune & last paper of the day by Mr. Maheshwar Marathe, CMRS & Associates LLP, Pune on 'Building strength in MSMEs'. The session was chaired V Srinivasa Reddy, Ex. Director, Synergy Green Industries, Kagal.

This was followed by a musical entertainment programme & Gala Dinner Night at The Pavilion Hotel, which was thoroughly enjoyed by all the delegates.

The 3rd session on 16th Oct. consists of two Papers first Case Study by Mr. Prakash Rathod, MD, Caspro Group of Industries, Kolhapur on 'Pain to Peace - Machining as a substitute for fettling' & second on 'Future electrified technologies for India to make carbon neutral mobility' by Raju Ketkale, Sr.

VP, Toyota Kirloskar Motors, Biddad. The session was chaired by Mr. Mahesh Date, Ved Industries, Hatkanagale.

4th session after Tea Break started with a Health Talk by Nital Raval, Founder, Biorhythm India, Pune on 'The Greatest Wealth is Health' & another presentation by Ms. Tejashree Joshi, GM, Godrej



Boyce Mfg. Co. Ltd., Pune on 'Boosting Foundry Sustainability'.

The session was chaired by Ravi Dolli, Castco, Kolhapur.

5th Session after Lunch break consists of two papers first by Dr. Santosh Bhawe, Director HR, Bharat Forge, Pune on 'Competitive Advantage Through People in Digital Era' & last

presentation of Wescon-2022 was delivered by Mr. V Srinivasa Reddy, Ex. Director, Synergy Green Industries, Kagal on 'Digitalization: Foundrymen's Perspective'. The session was chaired by Mangesh Patil, Maurya Group, Kolhapur.

The concluding 6th session in the evening was an exclusive Panel Discussion moderated by Sanjay Karkhanis of Samarth Magna Group, Hatkanagale. Panel Members Anand Deshpande, Sound Castings Pvt. Ltd. Kolhapur, Bipin Jirge, MD, IFM Electronic India P.L., Kolhapur, Prakash Rathod, Caspro Group, Kolhapur & V Srinivasa Reddy, Synergy Green Industries, Kagal.

During the Valedictory function there were felicitations of all Wescon-2022 - Committee Members. Abhishek Soni proposed vote of thanks.

Chapter Chairman Sachin Shirgaokar, Chairman, 'Wescon-2022' Organizing Committee, Prakash Rathod, Convenor Samir Parikh, Co. Convenor, 'Rajesh Somani, Vice Chairman Mahesh Date, Hon. Secretary Vinay Khobare, Hon. Treasurer Rahul Patil, Finance Committee Chairman Rajiv Parikh, Technical Committee Chairman Malhar Bhandurge, Delegate Registration Committee Chairman Jaykumar Parikh, Milind Bhawe, Mangesh Patil, Mr. Sharad Totla, Sumeet Chougule, Mlind Biradar, Santosh Rangrej, Ravindra Patil, Mr. M.B.Shaikh, Deepankar Biswas, Sanjay Patil & other committee members of 'Wescon-2022' worked tirelessly in making the seminar a grand success. ■

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3D Printing - A new era in material science

Materials are the primary supplies for making objects for the end user. Wood is used to make furniture of toys; polymers to make into household objects, sheets, yarn etc; metals like iron, copper, aluminium are used to make useful articles like automobile parts, utensils, wires & cables; textile materials are used to make garments L, upholstery or thread; cement is used to make buildings or roads! The Classical way of building useful objects from primary materials is by 'shaping & sizing' it. To start with a 'bit' of the starting material is taken and it is made into the required shape using conversion techniques such as drawing, rolling, moulding, forging etc, the excess material is removed and the final object is made. Multiple such objects or parts are put together or 'assembled' to make the final useful item. This process, as you must have noticed, involves loss of the 'excess' material with the recovery of the object at 60-75% of the starting mass for each process step. Thus, for example, the actual amount of material required to make a final object could be significantly higher. Not that the excess material used is always a loss! But the 'excess' carved out of

the final needs to be reprocessed using additional material, energy & effort, as is fine on conventional material processing industry (recycling log melt spillage, reuse of shreadings in a lathe turning operation or chippings of wood to name a few). This approach has issues of recovery, excess material usage, skilled worker requirement, multiple step processes, time and machinery requirement and hence cost. To quote the case, per kg cost of aluminium ex smelter goes up three-fold when made into a rolled sheet or extruded channel and up to anything that is twelve-fold onward when made into an end user object like a piece of utensil or a cable or a car engine or multifield when made into a car.



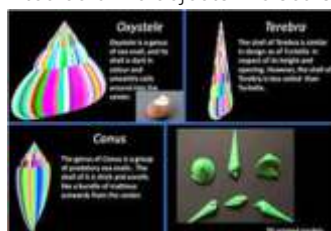
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Mother Nature does not produce objects in this manner. It builds objects molecule by molecule, particle by particle, brick by brick, which is called as the 'bottoms up' manner with little or no waste. In the last decade, material scientists and engineers have tried to adapt this technique of building objects. There are a few successful manifestations of these efforts- 3D printing is the most successful of such techniques. Looking at creation of small objects in Nature, one can see how putting up layers of solidifiable materials on top of each other leads to the creation of a three-dimensional object. For example, pearls are created by layered crystallisation of calcium carbonate with traces of calcium chloride and calcium sulphate along with a protein named as *Conchiolin* that serves as a binder for the microcrystals of CaCO_3 . Starting with a particle (=a one dimensional 'point'), and following a particular trajectory for growth of the CaCO_3 crystal, in a chosen environment, a 3D spherical structure gets created, as if with a predefined geometrical code. Sea-shells- the exoskeleton of soft-bodied mollusks is created by a similar process, through controlled & directed crystallisation of calcium carbonate/ phosphate



printed ceramic objects like sea shales

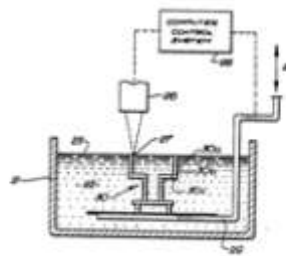


Naturally occurring sea shales in various shapes.3D



Technology

along with intermittent release of binding proteins of animal origin (viz. *Conchilin* and *Chitin*) which result in layered deposition, finally forming a *designed* 3-D pattern. Observation and analysis of such natural processes appears to have given the thought of replicating it synthetically; and the thoughts of creating such patterns in two dimensions through printing on paper, using a printer and pre-coding of what is to be printed with a program led innovators to conjecture using printers for creating objects.



Process	Traditional manufacturing	3D Printing
Geometry	Limitations	No limitations, flexible and complex parts, infill options
N° of processes needed to get to final shape	One or more	One
Stocks needed	Yes	No
Profitability	Based on large batches	Independent of number of units
Goal	Mass production	Mass customization

Advantages of 3D printing technology vs traditional manufacturing processes are well described: (Ref:<https://www.roboze.com/en/resources/additive-manufacturing-vs-traditional-manufacturing-cost-and-advantages-of-3d-printing-technology.html>). Origin of 3D Printing: The credit for initiating work on 3D printing goes to a Japanese Automobile Engineer HideoKodama, working for General Motors in Germany. Kodama was hard pressed for a way to

make prototypes for his work expeditiously to create a prototype cost effectively and speedily. Conventional processes would have taken time and machinery which itself had high cost and was unaffordable for making a single prototype! Kodama proposed to deploy a layer-by-layer deposition of a photo-sensitive resin polymer to build this part to the required size. Resins are a common material in the composition of conventional printing inks and the idea of printing on top of an already

printed 2D surface gave him the solution for building a 3D object using a printer. All the experiments in 3D printing started with Kodama, the credit for developing the concept into technology goes to an American named as Chuck Hull- an American furniture builder, who was frustrated with not being able to easily create small custom parts, and he independently developed a system for creating real 3D models by curing photosensitive resin layer by layer and applied for a patent for the process, then named as stereolithography (SLA) back in 1986. Charles Hull was the first to foresee the potential and scope of the 3D printing process, and led the work by forming the first company to work on 3D printing services, M/s 3D systems, based in South Carolina, USA, that has been the founding stone of 3D printing technology, products, processes etc over last thirty years. Charles Hull himself and his disruptive invention of SLA-1 -stereolithography were rightfully honoured by the American Society of Mechanical engineers -ASME for 'transformational impact in engineering and manufacturing.'Charles Hull himself is the co-inventor in more than sixty patents covering various aspects of 3D printing technology; and his company leads the sector with a turnover of USD 650 million dollars. 3D printing now covers more than patents, and is rated ninth among the top ten first growing technologies worldwide, with a patent filing growth rate of over 35%.

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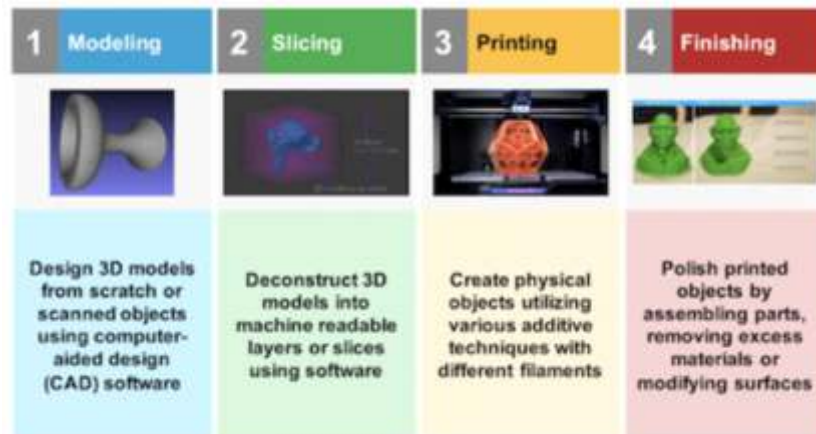
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Many reputed companies worldwide have patents on 3D printing and they cover Hewlett Packard, GE, Kinpo Electronics, XYZPrinting, Ford, Autodesk and Boeing. 3D printing technology: 3D Printing is defined simply as the action or process of making a physical object from a three-dimensional digital model, typically by laying down many thin layers of a material in succession.

What started as a curiosity to make rapid prototyping of components, now encompasses multiple aspects, from design, digitization of design, coding to link the design to printing process, printer machinery, software, and processes such as printing, thermal treatment, material science etc. Typical block diagram of the processes involved in 3D printing are represented as follows:



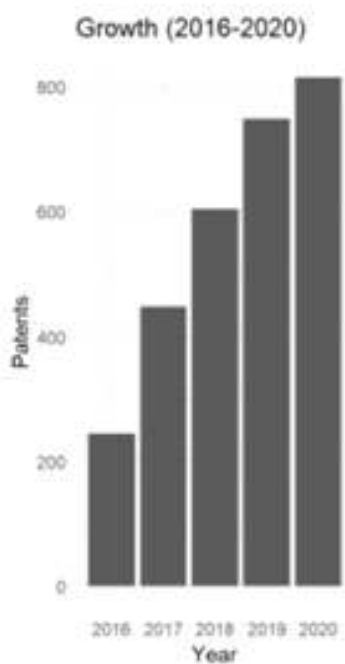
given to remove the support, clean the surface, and cure the object to form a permanent shape. A thermal treatment may be

Variation in the materials used for printing could be described as follows:

We start with a sketch or drawing of a 3D object that is to be created; and preprocess it to describe in STL file format, that is amenable to machine processing. Since 3D printing involves layer by layer printing, the model mathematically describes each layer or *slice* in terms of its dimensions, along with the support used during printing. While the *Printer* is

capable of depositing the required material with a spray nozzle maintained as a solution or melt at the operating conditions, it is coordinated to deposit the material precisely as per the model on each layer, then move onto the next layer and continue forming the third dimension. Once formed as a green preform, post-treatment is

required in the process to burn off any polymeric support or organics used for binding. The process can operate to make a single object or use multiple printer heads concurrently to make mass production. A single printer machine can be used with different designs to make multiple components. Concurrent use of multiple materials, used during the forming process has also led to the title of 'Additive Manufacturing' for the 3D printing process. The flexibility in printing any part, with any material offers the capability to match a photocopying machine of the 80s o this technology and the day is not far when you would find 3D printers at every corner shop, where you could go with a design or an object to be copied and create a replica in minutes. Applications: The wide capability of 3D printing technology has offered potential applications in all areas of life as summarised by Nabil M. Salih and M. Kadhim in their publication (Ref: https://www.researchgate.net/figure/Demonstrates-the-uses-of-the-3D-printer_fig1_324609043). ■



Potent Classification B33Y 40 3D Printing is growing at a CAGR of 27.14 percent. Image via IFI CLAIMS.



Copper edges higher on low stocks; China COVID curbs weigh



Copper prices edged up on 8th November 2022, supported by low inventories level, but China's determination to maintain a strict zero-COVID policy capped

gains.

The most-traded December copper contract on the Shanghai Futures Exchange (SHFE) was up 0.3% at 65,780 yuan (\$9,061.11) a tonne, as of 0755 GMT, while three-month copper on the London Metal Exchange (LME) edged up 0.2% at \$7.931 a tonne.

London copper prices jumped 7.3% last week, their best weekly gain since March, while SHFE copper hit its highest since June 20 on Monday, amid hopes that China would ease its strict COVID-19 curbs, which could boost metals demand.

The price increase was exacerbated by low inventories in global warehouses, especially in China, where stockpiles in SHFE and bonded warehouses combined were at 84,164 tonnes, hovering near their record low of 72,159 tonnes hit in October.

Chinese authorities, however, reaffirmed its stance on stringent restrictions to control coronavirus outbreaks, causing metals prices to retreat.

"Over the weekend, the expectations that the anti-epidemic policy would be liberalized fell short, and the price fell in a limited way to repair the overly optimistic expectations," said Jinrui Futures in a report.

Kamoa Copper Achieves 33,379 Tonnes of Copper Production during October 2022 vanhoe Mines (TSX: IVN) (OTCQX: IVPF) Co-Chairs Robert Friedland and Yufeng "Miles" Sun are pleased to announce today that the Kamoa-Kakula Mining Complex in the Democratic Republic of Congo produced 33,379 tonnes of filtered copper in concentrate during the month of October.

At the end of October, there was an additional 5,786 tonnes of floated, but not yet filtered, copper in inventory. This marks the second month in a row that floated and filtered copper production from the Kamoa-Kakula Mining Complex has exceeded 400,000 tonnes per annum on an annualised basis.

The Phase 1 and 2 milling and flotation circuits continue to operate in excess of design capacity. The difference between floated, and subsequently, filtered copper arises from the current bottleneck in concentrate thickening and filter capacity at the tail end of the processing circuit. Excess floated copper is currently being temporarily

stored as a slurry in a fully-lined pond adjacent to the Phase 1 and 2 concentrators. The unfiltered copper in inventory will be reclaimed into the concentrate thickener and filter press once capacity is expanded following the installation of a new concentrate thickener and Larox filter press, as part of the ongoing de-bottlenecking program.

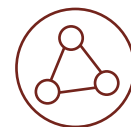
The previously announced de-bottlenecking program is approximately 70% complete and is tracking ahead of schedule. The program, which is expected to be complete in Q2 2023, will increase the combined design processing capacity of the Phase 1 and Phase 2 concentrator plants from 7.6 million tonnes per annum to approximately 9.2 million tonnes per annum.

Kamoa-Kakula's Phase 1 and 2 concentrators milled 713,439 tonnes of ore in October, equivalent to a run rate of 8.6 million tonnes per year. During the month, the processing team at Kamoa-Kakula stress-tested the operating rate of the Phase 2 concentrator and over a 24-hour period achieved a record of approximately 14,000 tonnes of ore milled. This is equivalent to a milling rate from both the Phase 1 and 2 concentrators of 9.3 million tonnes per annum (after accounting for availability).



The installation of the scavenger-cleaner flotation cell at the Phase 2 Concentrator is nearing completion. The de-bottlenecking program is expected to be complete in Q2 2023.





Construction of the additional concentrate thickener is advancing well. The debottlenecking program is approximately 70% complete and is tracking ahead of Ivanhoe Mines to issue Q3 2022 financial results and host conference call for investors on November 14

Ivanhoe Mines will report its Q3 2022 financial results, and a detailed update on its operations, before market open on Monday, November 14, 2022.

The company will hold an investor conference call to discuss the Q3 2022 financial results at 10:30 a.m. Eastern time / 7:30 a.m. Pacific time on November 14. The conference call dial-in is +1-416-764-8650 or toll free 1-888-664-6383, quote "Ivanhoe Mines Q3 2022 Financial Results" if requested. Media are invited to attend on a listen-only basis.

Link to join the live audio webcast:

<https://app.webinar.net/YvWzpn3maEn>

An audio webcast recording of the conference call, together with supporting presentation slides, will be available on Ivanhoe Mines' website at www.ivanhoemines.com.

After issuance, the Financial Statements and Management's Discussion and Analysis will be available at www.ivanhoemines.com and at www.sedar.com.

About Ivanhoe Mines

Ivanhoe Mines is a Canadian mining company focused on advancing its three principal projects in Southern Africa: the expansion of the Kamoa-Kakula Mining Complex in the Democratic Republic of Congo, the construction of the tier-one Platreef palladium-rhodium-platinum-nickel-copper-gold project in South Africa; and the restart of the historic ultra-high-grade Kipushi zinc-copper-germanium-silver mine, also in the Democratic Republic of Congo.

The Kamoa-Kakula Mining Complex is the highest-grade and fastest growing of the top 10 copper mining operations in the world. Copper concentrates were first produced in May 2021 and, through on-going phased expansions, the Kamoa-Kakula Mining Complex is positioned to become one of the world's largest copper producing operations. Kamoa-Kakula's 2022 production guidance is between 310,000 to 340,000 tonnes of copper in concentrate.

The Kamoa-Kakula Mining Complex is powered by clean, renewable hydro-generated electricity and is among one of the world's lowest greenhouse gas emitters per tonne of copper metal produced.

The Kamoa-Kakula Mining Complex is operated by Kamoa Copper, a joint venture between Ivanhoe Mines (39.6%), Zijin Mining Group (39.6%), Crystal River Global Limited (0.8%) and the DRC government (20%).

Ivanhoe Mines is also exploring for new copper discoveries across its circa 2,400km² of wholly-owned exploration licences in the Western Foreland, which are located adjacent to the Kamoa-Kakula Mining Complex in the Democratic Republic of Congo.

Certain statements in this news release constitute "forward-looking statements" or "forward-looking information" within the meaning of applicable securities laws. Such statements involve known and unknown risks, uncertainties and other factors, which may cause actual results, performance or achievements of the company, the Platreef Project, or industry results, to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements or information. Such statements can be identified by the use of words such as "may", "would", "could", "will", "intend", "expect", "believe", "plan", "anticipate", "estimate", "scheduled", "forecast", "predict" and other similar terminology, or state that certain actions, events or results "may", "could", "would", "might" or "will" be taken, occur or be achieved. These statements reflect the company's current expectations regarding future events, performance and results, and speak only as of the date of this news release.

Blockades at Peru's Las Bambas copper mine hit operations



The huge Las Bambas copper mine in Peru has started to reduce operations due to recent blockades, the mine said in a statement recently. Las Bambas, owned by Chinese firm MMG Ltd, is one of the largest copper mines in the world, but has suffered frequent disruptions from largely poor indigenous communities.

Peru is the world's No. 2 copper producer.

"We have been forced to begin a progressive slowdown of our operations since Oct. 31," the company said in a statement.

"There is also the threat of new interruptions to our Las Bambas operations in the very near term."

On top of frequent road blockades, Las Bambas fully stopped operations for over a month this year when two communities that had sold land to make way for the



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company re-entered those areas.

While one community was evicted, the other – called Huancuire – remains in the property, the company said.

“The weakening of the state's capacity to combat conflicts is notable,” Peruvian mining industry group SNMPE said in a statement.

The disruptions against Las Bambas follows protests at another large mine, Hochschild Mining PLC's Inmaculada, which produces gold and silver.

Copper prices climb as Peru disruptions fuel supply concerns



Copper prices rebounded on Friday as production disruptions in Peru, the world's second-largest copper producer, sparked fresh concerns over supply of the metal against thin inventories.

Three-month copper on the London Metal Exchange CMCU3 was up 0.5% at \$7,597 a tonne, as of 0221 GMT, while the most-traded December copper contract on the Shanghai Futures Exchange SCFcv1 held its ground at 63,390 yuan (\$8,681.18) a tonne.

This reversed a decline from the previous session where prices of copper, often used as an economic indicator, sagged after the U.S. Federal Reserve failed to provide a clear signal for less-aggressive hikes to interest rates as a global slowdown curbs demand for metals.

The huge Las Bambas copper mine in Peru, owned by Chinese miner MMG Ltd 1208.HK, has started to reduce operations due to recent blockades, the mine said in a statement on Thursday. Las Bambas, whose operations have often been disrupted by protests from neighboring indigenous communities, accounts for 2% of global copper supply.

MMG Ltd in August lowered its forecast for annual copper production at Las Bambas to 240,000 tonnes. Total copper production in Chile, the world's biggest producer, fell 4.27% in September to 428,300 tonnes, according to the government body Cochilco. This came against the backdrop of low inventories in the market.

Copper stocks in LME warehouse dropped 8,250 tonnes

on Thursday. Among other metals, SHFE aluminium SAFcv1 gained 0.6% to 18,130 yuan a tonne, zinc SZNcv1 was up 1.3% at 23,115 yuan a tonne, while nickel SNIcv1 lost 0.8% to 191,100 yuan a tonne. LME aluminium CMAL3 added 0.2% to \$2,268 a tonne, tin CMSN3 increased 0.2% to \$17,800 a tonne and zinc CMZN3 rose 0.7% to \$2,738.50 a tonne.

Copper: Miners have an opportunity to emerge as leaders in a critical transition

Energy transition will drive the demand for metals. The world's shift to net zero will require more mining, not less. The rapid scaling of the low-emission energy systems NSE -0.95 % of the future—solar and wind power, electric vehicles and grid-scale batteries will be highly material-intensive. With a 127% increase in profits, miners have never been better placed to take advantage of new opportunities and ensure sustained outcomes.

f the future—solar and wind power, electric vehicles and grid-scale batteries will be highly material-intensive. With a 127% increase in profits, miners have never been better placed to take advantage of new opportunities and ensure sustained outcomes.

ESG remains a key pressure point but also an opportunity for miners. According to PwC's review, the top 40 mining companies' future success will depend on whether they take a leading role in the world's clean energy transition and continue to generate significant stakeholder value. This year's report suggests that the rewards for those miners that emerge as leaders in the clean energy transition could be immense.

According to recent data, the need for “critical minerals” — such as copper, nickel and cobalt — is expected to grow over the next three decades, with some estimates suggesting that the annual demand from clean energy technologies will reach over \$400 billion by 2050.

Iran targets 1m tons of copper cathode output in 6 years



Iran plans to increase its copper cathode production to one million tons per annum within the next six years under the framework of a comprehensive plan for copper industry development, Chairman of Iran Copper Association Bahram Shakouri announced.



According to Shakouri based on the mentioned plan which has been drafted by the Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO), the country's copper cathode output is expected to reach 800,000 tons per annum by 2025. He put the country's current copper cathode production at over 300,000 tons adding that the one-million-ton goal will be achieved by the cooperation of private sectors and the development of current projects.

"The world's movement towards the use of clean technologies and innovations will increase the consumption of non-ferrous metals such as copper, and in the coming years, there will be a need to supply copper up to four times today," Shakouri said.

The increase in demand will increase the price of copper, and accordingly, we must move towards completing the copper chain in Iran, he added.

"Today, the copper chain is complete with cathode production in the country, while more than 50 percent of the copper cathode is being exported, and if we can create more added value in this sector, we will have more exports and gain more revenue," Shakouri concluded.

Production of copper cathode in Iran rose 2.8 percent in the past Iranian calendar year 1400 (ended on March 20), from its previous year, Industry, Mining and Trade Ministry has previously reported.

As reported, the country produced 299,000 tons of the product in the past year.

Copper cathode is the primary raw material input for the production of copper rods for the wire and cable industry. In May, Shakouri said that according to forecasts copper production in the world by 2050 should reach four times the current level which is over 1.8 million tons.

Being located on the Alpine-Himalayan orogenic belt, of which about 12.5 percent is located in Iran, the country should contribute greatly to the fourfold increase in the world's copper production by 2050, Shakouri said.

Stressing the need for planning to increase Iran's share in the world's copper production, he added: "To increase our share in the global copper production in the 2050 horizon, we must develop both exploration and extraction and discover new world-class reserves."

According to the official, Iran Copper Association is currently leading the country's copper exploration programs in collaboration with the private sector.

"New copper mines recently discovered in Sistan-Baluchestan Province (in the southeast of the country) have been the result of such efforts," he said.

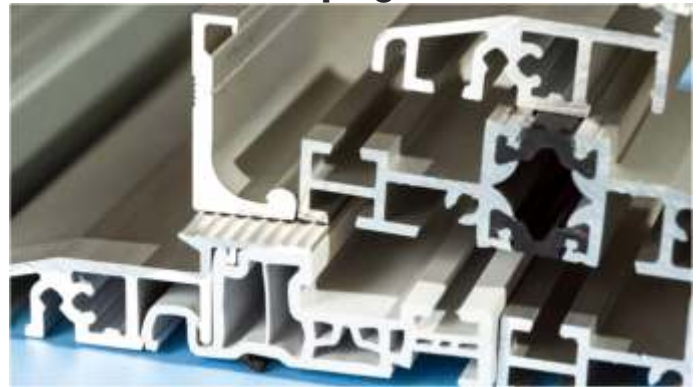
Shakouri stressed that the mining sector, especially in the field of copper, has a bright future considering the

elimination of fossil fuels and the movement towards new technologies, saying: "If the country's mining capacities in the copper field are realized, given the rising global prices for the mentioned product, at least \$10 billion of revenues could be generated for the country, along with creating more employment and production which ensures the development of deprived regions."

The official noted that currently, most of the country's copper cathode production is exported due to the underdevelopment of downstream industries.

"The government should support downstream industries, including wire and cable production units, and provide incentives to other high-tech industries that use copper products," Shakouri stressed.

UK aluminium sector at threat of wipeout by post-Brexit anti-dumping duties



British manufacturers have warned that proposed UK anti-dumping duties on Chinese aluminium extrusions are too low and threaten to cause a flood of imports, factory closures and job losses. In its first new post-Brexit investigation, the Trade Remedies Authority, an independent government advisory body, has recommended setting duties on aluminium extrusions from a group of three large Chinese exporters that collectively account for 70 per cent of the country's exports to the UK at 10.1 per cent. Aluminium extruding is a process through which alloyed material is heated and moulded into shapes that have uses in the automotive, infrastructure and construction sectors. The EU has set tariffs on the products at 22.1 per cent, while the US has put them at 33.3 per cent. Hydro Aluminium UK, the UK's largest producer of aluminium extrusions, accounting for a quarter of the market, has warned that if the TRA's recommendation is adopted it would be forced to close its factories, which employ close to 1,000 people and supply London's electric black cabs and Jaguar Land Rover. "It's not just a few percentage points difference, it's half of the EU level. The duties will be so low it will simply be absorbed by the Chinese exporters," warned Roger Ablett, managing director of extrusions at Hydro



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Aluminium UK. Chinese aluminium producers receive substantial government support, with a 2019 OECD report showing that 85 per cent of subsidies in the global aluminium industry went to five Chinese companies. Ablett warned that the lower UK tariffs on top of a steep rise in energy bills would result in factory closures, continuing a trend of consolidation and production shutdowns in the country. "If these final intended measures are at the level they are at the moment then it's obvious what will happen — that history of closure will continue," he said. "It could be a complete wipeout." He added that closures could also leave the UK re-exporting the Chinese extrusions to EU countries, putting Britain at risk of a trade dispute with Brussels. Small UK-based producers that supply another 25 per cent of the country's approximate 190,000 tonnes of demand for aluminium extrusions say they could also be at risk under the proposed duty. Roger Hartshorn, managing director of Garner Aluminium Extrusions, which employs 155 people, said his company would struggle to compete with Chinese producers unless the anti-dumping tariffs were raised to match other nations. "In reality if they take away the boundaries or open up the floodgates, we will be left exposed and the UK will lose its internal supply chain for aluminium products," he warned. The TRA has had a faltering start since it was established in 2021. It was forced to change its position on anti-dumping duties on steel from China in September after provoking outcry from the domestic industry after initially suggesting measures on imports should be lifted. The authority began its investigation into the Chinese companies last year and concluded in May that it had "found clear evidence of dumping and injury" for UK producers. Its recommended tariffs for aluminium extrusions range from 7.3 per cent to 29.1 per cent depending on the producer. A TRA spokesperson said its recommendations were based on evidence related to "the UK market only", which differs from the EU and US in several aspects. They added that provisional measures had been put in place in the meantime to prevent further damage to British producers. A final recommendation will be submitted to the secretary of state for international trade in the coming weeks.

Aluminium producers stare at declining margins on high production cost: CRISIL

Operating margins of Indian primary aluminium producers is expected to decline more than 1,200 basis points (bps) this fiscal to 22-24% from a decadal high of 36% seen last fiscal, said CRISIL Ratings on Monday, adding that the decline is due to lower realisations and higher cost of production, mainly power.



As per CRISIL Ratings, domestic primary aluminium producers saw record earnings last fiscal on the back of strong realisations when prices reached a historical high amid post-Covid economic recovery, with the global aluminium market turning supply deficit. In the current fiscal, however, operating margin is seen retreating closer to past levels, but would still remain higher than the average of 17% over fiscals 2017-21.

"Despite the moderation in margin, operating profits may remain better than the past 5-year average, partly owing to strong domestic demand growth of 6-7 percent on-year for aluminium products, mainly from the power and construction sectors. The two comprise 70 percent of total sales volume for these manufacturers," it said. The rating agency highlighted that London Metal Exchange (LME) prices for aluminium have fallen 40% from the March peak to \$2,300 per tonne because of extended lockdown restrictions in China and growing recessionary pressures impacting global demand in the first half of calendar 2022. Global supply remained robust driven by production increases in China amid relaxation of power restrictions.

"Prices in the second half of the fiscal are expected to remain range-bound around current levels, supported by low inventory levels at LME and recent production cuts in Europe which may partly offset the impact of higher Chinese production. Overall, global demand is expected to contract 1-2% in calendar 2022 after growing over 5% in 2021, against an expectation of a moderate growth in global supply in the current year. Consequently, average LME price for the metal will range between \$2,300- \$2,500 per tonne through fiscal 2023 (against \$2,774 per ton in fiscal 2022). Domestic realizations are also expected to dip in sync, as they are driven by the landed cost of imports," said Ankit Hakhu, director, CRISIL Ratings. According to CRISIL, the cost of production for domestic producers can rise 10% on year, driven by rising coal prices. Power cost, constituting 30-35% of production costs is projected to increase the most among all costs, fuelled by an increase in energy demand and disruption in global supply chains brought on by the Russia-Ukraine



conflict.

"Domestic producers rely on market purchases for 30 percent of their coal requirements. Further, for linkage coal, materialization will be lower this fiscal as priority is being accorded to the power sector. Despite the increased cost of production, Indian producers are still among the lowest cost in the world driven by highly integrated operations with 70-75 percent backward integration, on average. As a result, Indian producers currently export over 60 percent of their annual production," it added.

Aluminium pulls back as China COVID cases climb, dollar gains

Aluminium prices fell on 8th November 2022 after an upsurge of COVID-19 cases in China, further dampening hopes that the world's top metals consumer would loosen strict curbs.

New coronavirus cases jumped in global manufacturing hub Guangzhou, data showed on Tuesday, testing the city's ability to avoid a Shanghai-style lockdown.

Benchmark aluminium on the London Metal Exchange CMAL3 was down 0.8% at \$2,317.50 a tonne by 1100 GMT, the second day of losses.

Also weighing on the market was a firmer dollar, making greenback-priced metals more expensive to holders of other currencies.

Aluminium, copper and other industrial metals climbed on Friday on hopes that China would ease its strict COVID-19 curbs, which could boost metals demand.

"It was a phenomenal rally on Friday, but with the reasons behind the rally somewhat softening it does make sense that we're seeing a retracement," said Ole Hansen, head of commodity strategy at Saxo Bank in Copenhagen.

"It's a market that's still consolidating. It looks as if it wants to go higher, but the trigger for that to happen is still not strong enough."

Concerns over supplies and low inventories have helped support copper, which shot up 7.1% on Friday, its biggest one-day gain since January 2009. LME copper rose 0.3% on Tuesday to \$7,935 a tonne after earlier probing lower. The most-traded December copper contract on the Shanghai Futures Exchange (SHFE) SCFcv1 added 0.3% to 65,780 yuan (\$9,061.11) a tonne.

LME copper inventories MCUSTX-TOTAL touched their lowest in more than seven months on Tuesday, having slid 43% over the past month.

In China, stockpiles in SHFE and bonded warehouses combined were at 84,164 tonnes, not far from their record low of 72,159 tonnes hit in October.

LME zinc CMZN3 eased 0.6% to \$2,868 a tonne and lead CMPB3 dropped 1% to \$2,015.50, but nickel CMNI3 rose 0.3% to \$23,455 and tin CMSN3 climbed 2.4% to \$19,400.

Hindustan Zinc Q2 Results: Net corrects sequentially due to high input costs, lower metal prices

Hindustan Zinc on Friday reported a sharp increase in profitability during the second fiscal quarter compared to the year-ago period, buoyed by higher commodity prices, but financials shrunk compared to the preceding quarter as prices corrected and input costs climbed higher.

The company reported a 36% year-on-year growth in its consolidated top line to Rs 8,336 crore but it corrected by 11% sequentially. Earnings before interest, tax, depreciation and amortisation (EBITDA) grew 32% on-year to Rs 4,390 crore. However, EBITDA took a 17% hit sequentially on account of high power and fuel costs.

Hindustan Zinc wins JURY Award under at 3rd TIOL National Taxation awards 2022



Hindustan Zinc, a Vedanta Group-owned zinc, lead, and silver producer, has been awarded Jury award under the "Non-Deemed Corporate above Rs 5000 crore turnover" category at the TIOL 2022 awards held in New Delhi. Hindustan Zinc holds the first position while, Zydus Lifesciences Ltd. holds the second position, and Tata Power holds the third position. The award was bestowed upon Hindustan Zinc by an eminent jury of Justice A.K. Pattanayak, former SC Judge, Justice S.K. Singh, former SC Judge, Mr. A.N. Jha, former Finance Secretary & Vice Chairman of the 15th Finance Commission, Mr. Ramesh Abhishek, former Industry Secretary to the Govt. of India, Ms. Praveen Mahajan, former CBEC Chairperson, former CBDT Chairman, Mr. Ashok Bhattacharya, Editorial Director of Business Standard, Dr. Girish Ahuja, Member, Task Force on Direct Tax Code, an eminent author, Ambassador Ajit Kuma, Former Permanent Representative of India to United Nations Office and Mr. Anup Vikal, CFO, Head of Legal & CSR- Nayara Energy Ltd. On this achievement, Mr. Arun Misra, CEO, Hindustan Zinc, said, "We're glad that our organization's adoption of the best tax practises resulted in recognition on such an esteemed platform. Our intent is to develop & sustain positive relationships with the locals, government, and



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communities where we operate through transparent & robust tax compliances and reporting.”

Adding to that, Mr Sandeep Modi, Interim Chief Financial Officer, Hindustan Zinc, said, “The global tax environment has entered a new era of tax transparency and at Hindustan Zinc we aim to imbibe the highest standards of integrity with respect to tax compliance & reporting. This award is a testament to our standards in delivering value & transparency to all our stakeholders.”

The aim of this award is to 'Motivate, Encourage, and Acknowledge the Contribution of Compliant Taxpayers.' This Award is testimony that Hindustan Zinc is fully compliant with taxation laws and rules, which indicates the robustness of its tax function in terms of compliance and reporting requirements. The company has contributed more than USD 9 Bn to the exchequer in the last 5 years, while in FY 2021–22 the total contribution to the exchequer was over USD 2 Bn which plays an important part in wider economic and societal impact and therefore plays a key role in the development of the country.

Hindustan Zinc strives to be fair, honest, accountable, and ethical in its conduct and is committed to following the letter and spirit of the applicable tax rules and regulations of the jurisdictions where it operates. The company maintains the highest standards of integrity with respect to tax compliance and reporting.

CSR: Hindustan Zinc fights back the Scare of Lumpy Skin Disease through its 'SAMADHAN' Project



More than 24,000 medicinal kits and 35,000 pamphlets sharing key details and information about Lumpy Skin Disease were distributed among villagers

Udaipur: Hindustan Zinc, a Vedanta Group-owned zinc, lead, and silver producer, under its Samadhan project has been relentlessly working to mitigate the spread of Lumpy Skin disease that has become a global concern as it continues to spread rapidly amongst cows. Fighting back the critical situation, several initiatives have been adopted across 185 villages in five districts of Ajmer, Bhilwara, Chittorgarh, Rajsamand, and Udaipur.

Under the purview of this initiative, the Samadhan team collaborated with District Collectors, Additional Directors and Joint Director of the Animal Husbandry Department in the State to strategize prompt actions to control the alarming situation. The on-ground team of Hindustan Zinc in association with the government officials conducted six goat pox vaccination drives which has been proved 100% effective against the virus. Furthermore, with the guidance of the government veterinary department, fumigation camps were carried out wherein cypermethrin and hypochlorite solution were sprayed in around 185 villages covering around 23,000 households.

Additionally, more than 24,000 Medicinal kits were distributed and around 200 awareness sessions were conducted at the village level through Hindustan Zinc's FIG and FPO platforms to educate the villagers about the effects of the viral infection on cattle. 35,000 pamphlets were distributed to sensitize the villagers about the disease and to provide detailed precautionary measures to be adopted for protecting their livestock from the viral disease.

Samadhan program, a Hindustan Zinc CSR initiative operational since 2016, along with BAIF, reaches out to farmers to provide quality assistance and knowledge about agriculture and animal husbandry. Hindustan Zinc is the only Indian company to be recognised at the S&P Global Platts Metal Award 2022 and has won the prestigious award 'Corporate Social Responsibility' Award. Strengthening the core belief of care for its community, the Samadhan project seeks to ensure sustainable livelihoods for earmarked families through integrated farming systems and livestock development.

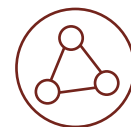
KKR to invest \$400 million in Vedanta arm

Serentica Renewables is wholly-owned by Agarwal's Twinstar Overseas, which owns controlling stakes in Sterlite Power Transmission and Sterlite Technologies.

US private equity major KKR said that it has signed agreements to invest \$400 million (about Rs 3,262 crore) in decarbonisation platform Serentica Renewables, a group company of billionaire Anil Agarwal, which plans to provide clean energy solutions.

Serentica Renewables is wholly-owned by Agarwal's Twinstar Overseas, which owns controlling stakes in Sterlite Power Transmission and Sterlite Technologies. The company had set up its decarbonisation platform in September this year.

The company's medium-term goal is to install 5,000 MW of carbon-free generation capacity coupled with different storage technologies and supply over 16 billion units of clean energy annually and displace 20 million tonne of carbon-dioxide emissions. The company, which is in the



process of developing 1,500 MW of solar and wind power projects across various states, including Karnataka, Rajasthan and Maharashtra has also signed three long-term power purchase agreements.

Vedanta BALCO tests biodiesel as green fuel alternative



Vedanta-controlled Bharat Aluminium Co. Ltd (Balco) has successfully conducted trial runs for using biodiesel in smelter operations. In the pilot, the company used biodiesel for preheating molten metal (aluminium) carrying vehicles, called 'ladles', which transfer the hot metal in its molten state from its potlines to cast houses. A potline is a long building, or collection of buildings, located in a smelter and contains a series of 'pots', or large electrolytic cells, in which aluminium smelting is carried out. The preheating process is extremely crucial for removing any trace of moisture from the ladle.

This is important for maintaining the purity and temperature of the metal during its transportation to cast houses, where the molten aluminium is converted into various finished products.

Biodiesel is a form of fuel derived from organic matter which, when burned, produces significantly lower greenhouse gas (GHG) emissions compared to conventional, non-renewable fuels, besides aiding in farmers' income. This is in line with the company's ambitious target to become Net Zero Carbon by 2050 or sooner.

"Towards this end, Balco is looking at increasing the quantum of renewables in its energy mix through various sources of green fuels, such as renewable energy, biomass, biodiesel, etc," the company said in a statement.

"In FY2022, through various energy conservation initiatives, Balco has conserved nearly 22,000 GJ of energy. With endeavours such as these, Balco is taking significant strides towards contributing to Vedanta's aim to become Net Zero Carbon by 2050 or sooner," it added. Speaking about Balco's commitment towards decarbonizing its operations in the long term, Abhijit Pati, CEO & Director, Balco, said, "Balco is undertaking robust

initiatives towards decarbonization, such as innovating upon existing processes to increase energy savings and reduce GHG emissions. The successful pilot trial of biodiesel applications at our smelter encourages us to remain attuned to emerging technologies for reducing our carbon footprint. With excellence in Environment, Social and Governance (ESG) central to how we operate, Balco continues to proactively work towards bringing together business growth and environmental protection for sustainable socio-economic development."

Novelis' Q2 net income drops 23%

Hindalco Industries subsidiary company Novelis Inc, its wholly-owned subsidiary, reported a 23% fall in net income to \$183 million for the quarter ended September 30. Novelis Inc had posted a net income of \$237 million in the corresponding period of the previous fiscal, Hindalco said in a BSE filing. The company reported a 23 per cent fall in net income to \$183 million for the quarter ended September 30 against a net income of \$237 million in the corresponding period of the previous fiscal. Hindalco Industries stock fell to Rs 416.45, losing 4.81 per cent intraday on BSE. Market cap of the firm declined to Rs 94,179 crore. The stock has fallen after gaining for two days. Hindalco Industries shares are trading higher than 5 day, 20 day, 50 day and 100 day moving averages but lower than 200 day moving averages. Hindalco stock has lost 9.79% in one year and declined 11.85% since the beginning of this year.

Total 2.95 lakh shares of the firm changed hands amounting to a turnover of Rs 12.42 crore. Net sales rose 17% to \$4.8 billion in Q2 of the current fiscal compared to \$4.1 billion in the prior year period. However, adjusted EBITDA fell 8% to \$506 million in the second quarter of fiscal year 2023, compared to \$553 million in the prior year period.

Steve Fisher, President and CEO, Novelis Inc said, "The company delivered a solid second quarter despite challenging headwinds from inflation, the stronger US dollar, and reduced metal benefits, with good operational performance that allowed it to capture robust end-market demand in the quarter and increase total shipments."

Novelis is a global provider of sustainable aluminium solutions and is into aluminium rolling and recycling.

Nalco Q2 Results: Profit dips 83.2% YoY to Rs 125.43 crore

National Aluminium Company Ltd on Wednesday reported an 83.2 per cent decline in consolidated profit at Rs 125.43 crore for the quarter ended September 30, on the back of higher expenses and lower income.



News Update

The company had posted a consolidated profit of Rs 747.80 crore in the year-ago period, NALCO said in a regulatory filing. The consolidated income of the company during the July-September period dropped to Rs 3,558.83 crore, over Rs 3,634.59 crore in the year-ago period. The consolidated expenses of the company during the second quarter increased to Rs 3,312.95 crore, over Rs 2,618.52 crore in the year-ago period. Nalco, a navratna CPSE, is one of the largest integrated bauxite-alumina-aluminium-power complexes in the country. At present, the centre holds 51.28 per cent of paid up equity capital. The company has been operating its captive Panchpatmali Bauxite Mines for the pit-head alumina refinery at Damanjodi, in Koraput district of Odisha and aluminium smelter and captive power plant at Angul, in Odisha.

ASK Chemicals GmbH signs the Diversity Charter



The ASK Chemicals Group supports the Charta of Diversity and sets an example for more diversity and equal opportunities in the working environment. By signing the Diversity Charter, ASK Chemicals is setting a group wide



clear sign for diversity, equal opportunities, and tolerance in the working environment. The chemical company emphasizes the appreciation of all employees regardless of gender and identity, nationality, ethnicity, religion or ideology, disability, age or sexual orientation. Diversity in the workplace offers companies valuable opportunities. Diverse, multi-faceted teams bring together different perspectives, expertise, and backgrounds. They are more creative and effective than homogeneously composed teams. Projects, products, and services developed by such teams are usually more successful.

Frank Goede, CEO: "As a global company, we already live a diverse and well-established culture of diversity. We stand for a world-open togetherness and actively support the principles and goals of the Diversity Charter."

Rudi Nerinckx, CHRO: "Cultivating and living an organizational culture that is characterized by mutual respect and appreciation of all our employees is crucial to us. Because it makes all the difference - for the satisfaction of our employees and the success of our company." The ASK Chemicals Group wants to further foster the diversity already practiced in the company and cultivate a prejudice-free working environment in the ASK Chemicals Group.

Could Copper prices be poised for a breakout?

As per the AG Metal Miner, Copper Monthly Metal Index (MMI) moved sideways, with the overall copper price falling 2.0% from October to November. While volatility remains a risk, copper prices traded in a tight range throughout October. In general, prices traded just above the low found in late September. Copper was also among multiple base metals who's prices move sideways as the macro downtrend remains on pause.

Dollar Found a Top, Direction Uncertain November 2 marked the fourth consecutive (albeit universally-expected) 75-basis-point rate hike. Over nearly 8 months, the Fed has managed to raise rates by a total of 375 basis points. The steep increases continue to support a strong U.S. dollar, which has, in turn, helped pull the copper price downward. But as the U.S. dollar moves sideways, markets remain uncertain about future direction.

While a dovish pivot on the part of the Fed remains out of the question, officials appeared notably more qualified with regards to their future approach. According to a recent press release, "in determining the pace of future increases in the target range, the Committee will take into account the cumulative tightening of monetary policy, the lags with which monetary policy affects economic activity and inflation, and economic and financial developments." That said, Chairman Powell did caution markets that the Fed had "some ways to go" and anticipated "ongoing increases." Powell also noted "the ultimate level of interest rates will be higher than previously expected."

Copper Price Could Break New Lows

Despite months of hitting fresh 20-year highs, the macro uptrend for the U.S. dollar index faltered after peaking in late September. While it consolidated through October, the index rallied once again in the lead up to the Fed meeting in early November. However, continued but potentially-small rate hikes proved insufficient in sustaining that rally. Currently, the index continues to fall and may even challenge its late October low.

As the downtrend for the copper price index appeared to bottom out in mid-July, and prices have since struggled to break out of range. However, on November 3, prices saw



an over 5% rally as the U.S. dollar index began to slide, unable to create a higher high. For copper, this could prove the beginning of a breakout to the upside should the bullish momentum continue amid a weakening dollar. At the very least, a less volatile U.S. dollar would be a more neutral influence on copper and commodity prices alike.

China Rumors Spark Copper Price Rally

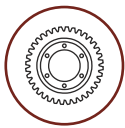
As the dollar weakened, speculation of a potential end to China's zero-COVID policies added further bullish sentiment. After nearly three years, China remains the last major hold out for an economically restrictive approach to the virus. Many expected that President Xi's reelection would trigger a policy reversal. Instead he used last month's 20th Party Congress to repeatedly declared his support for the restrictions. That said, rumors began to circulate in early November that Chinese policymakers aim to exit zero-COVID by March 2023. Such reports suggest officials are concerned over the economic costs of rampant lockdowns, which have dampened both demand and production.

Speculation that zero-COVID may soon vanish triggered rallies throughout multiple markets. For instance, the iShares China Large-Cap ETF (FXI) jumped almost 14% during the first week of November following months of heavy declines. Meanwhile, copper prices have been

supported over recent months due, in part, to strong Chinese demand, the prospect of China reopening helped prices bounce above their tight October trading range.

Officials Quick to Support Zero-COVID

Unfortunately, officials from the National Health Commission were quick to dump water on the rumors. By Nov. 5, official Hu Xiang called the approach "completely correct." He also characterized it as "the most economical and effective." While costly, zero-COVID has helped sequester domestic demand and therefore kept Chinese inflation low compared to other countries. This may be a factor in why China wants to keep a relatively loose monetary policy while Western nations continue to raise rates. Of course, support for zero-COVID among Chinese officials does not necessarily mean that the rumors are untrue. Indeed, the target date specified in those rumors is still roughly four months away. However, what is certain is that when China reopens, markets like copper will likely rebound. As production becomes untethered by restrictions and the full extent of Chinese demand is unleashed, the copper price could see historic moves.



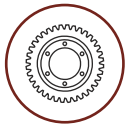
What have STEINERT sorting machines got in common with job satisfaction? We find out by talking to Tobias Thommen about the quality of aluminium sorting, sustainability and art.

Thommen AG, part of the Thommen Group, is a model Swiss metal recycling company based in Kaiseraugst near Basel. Its core business includes recycling iron scrap (FE), non-ferrous metals (NF), e-waste and cars. Growing to a group of companies over the decades, it now has 25 sites in five countries. Since 2011, Dr Tobias Thommen, grandson of the founder Gustav Thommen, has been Managing Director, a member of the board of directors and owner of the Thommen Group. His management style is guided by his heart and intuition – and for him people are the most important aspect of the business.

Tobias Thommen (58) has worked for the company for a very long time. Strictly speaking, he got his first job as a child when he operated the shear, repaired the shredder and knocked out the residue. After studying economics and then medicine, he practised as a doctor and yoga teacher for several years before taking on management of the company. During his interview with STEINERT, he says time and again, “It’s the people that make a company.” “The success and failure of a company are revealed through its people.” He attaches particular value to the ability to give and receive criticism – and he is no exception: “I’m not the remote chairman of the board, who no-one is allowed to talk to. People can talk to me about anything. If I make a mistake, then I need to correct it. This is something I have learnt from practising yoga.”

Zorba processing with real net output ratio

“Thommen is synonymous with quality. I would like us to be a beacon in the world of recycling,” emphasises the head of the company. In 2015, after the Thommen Group acquired the second super shredder in Switzerland, Tobias Thommen concentrated on the recovery of non-ferrous metals in the shredder heavy fraction and invested in a further processing facility for manufacturing high-grade aluminium, copper, brass, and zinc products. “I aspire to manufacture products such that our customers, i.e. steelworks, copper smelting plants, aluminium smelters or brass foundries, can smelt them straight away. And this requires a purity of close to one hundred percent. The ZAB (Zorba Processing Facility) with STEINERT sorting machines, which went into operation in 2021, has had a huge role to play in this respect.” Zorba is a mix of different



proportions of non-ferrous metals. Non-ferrous metal separators, also known as eddy current separators, recover this mix of metals before sensor sorting machines split the metals into pure fractions suitable for smelting works. To improve the efficiency of the sensor sorting machines, the non-ferrous metal concentrates are screened into different grain sizes, namely 0-15 mm, 15-30 mm, 30-60 mm, 60-120 mm and larger than 120 mm. These are then separated into both cast aluminium and wrought aluminium alloys by X-ray transmission, the STEINERT KSS | XT CLI. The system uses fluorescence technology (STEINERT KSS | XF CLI) to produce the pure-grade heavy-metal products. Sensors for colour (C), dimension (L) and induction (I) have been added to each of the two sorting machines at Thommen. This enables even more precise selection criteria to be set for complex and varied sorting jobs and also ensures that the company can flexibly rise up to future sorting challenges.

STEINERT technology is robust, precise and a joy for staff to use

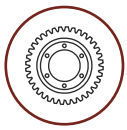
The third generation head of the company describes himself as an investor. A large share of his profits is ploughed back into the company. "I want my people to have the best production facilities and operating equipment to do their work." In describing the sorting machines, he says that he appreciates German thoroughness because it means that things are robust, reliable and deliver perfect results. He adds that STEINERT is not the cheapest supplier on the market. "But I am prepared to pay the additional price because I know that it works." He and his employees also like the modern feel of the controls and the performance levels. The eyes of his machine operators light up when they see the results, which reflects the pleasure they get from what they have produced. He in turn personally delights from taking sceptics along with him and then seeing how they passionately oversee the facilities. And for years now, he has been investing in the Thommen Academy and the group's "Talents" programme. Tobias Thommen stresses that he believes mixed teams are more effective because they cover different aspects. He is now laying the groundwork for just that and is equipping communal areas at the company sites so that a greater proportion of women can work there.

Sustainability closer to home too

"Recycling is in our DNA. I come from a family that was recycling before people were even aware of the concept." But the company also has objectives that are not related to its actual purpose but are of importance to society. "Environmental, Social, Governance", or ESG for short, sums it up. According to Tobias Thommen, the focus on ESG, i.e. social responsibility, is changing how people will work in the future. He is keen to be active in this field as he too is part of this society. So he has created a separate post to concentrate on these issues. Two specific examples are electrifying company vehicles and having photovoltaic systems installed on all warehouses and operating facilities within five years.

Grandfather and grandson don't see eye to eye when it comes to art

Tobias Thommen's fondness of scrap recycling and technology are also reflected in his hobby: art. The works of Jean Tinguely are particularly dear to him. Tinguely was a Swiss artist, renowned for his kinetic machine-like sculptures made from scrap. Grandfather Thommen took no pleasure in kinetic works of art and rejected the idea of donating his scrap to such projects. These days, Tobias Thommen pays tribute to the great international artist and has even purchased one of his works.



Dr Tobias Thommen is Managing Director of the Thommen Group, is a member of the board of directors and owner of the Thommen Group.



Easy to use and great results. Thommen machine operators enjoy working with STEINERT sorting machines.



The staff in the Zorba Processing Facility were once sceptical of this new sorting system, yet now they are excited by what it can do.



The STEINERT EddyC eddy current separator recovers non-ferrous metals (in the forefront). STEINERT KSS sensor sorting machines separate into aluminium, brass, copper and zinc.



The X-ray transmission generates the purest aluminium products (on right), the STEINERT KSS XF | CLI with X-ray fluorescence delivers the purest copper, brass and zinc products.



Products that aluminium smelting works, copper mills or brass works can smelt right away.



Higher passenger vehicles sold reported in October 2022 boosted by festive sales: SIAM

The Society of Indian Automobile Manufacturers (SIAM) in its latest report has that there was significant growth across all passenger vehicles following the domestic festive season. As per the latest data, a total of 291,113 passenger vehicles were sold in October, which is almost 60,000 units more than the October 2021 numbers. But it is less than the September 2022 figures, where 307,389 passenger vehicles were sold. Earlier this year, sales were affected due to a global shortage of semiconductors, which had affected automakers across all segments forcing them to cut down production. Besides, the monthly sales and export in 2022 have shown significant growth despite the challenges. The overall picture of the Indian automotive manufacturers is positive after the pandemic period.

Total vehicles sold in the Indian market were 20,93,378 units. This indicates an increase in total vehicle retail in India by 6,75,652 units which translates to 47.62 percent year-on-year increase in total vehicle retail. The figures for total vehicles retailed in the Indian market for October 2021 stood at 14,18,726 units.

As per the SIAM latest data reported that the total production of Passenger Vehicles, Three Wheelers, Two Wheelers, and Quadri cycle in the month of October 2022 was 2,191,090 units. Domestic sales includes Passenger Vehicles 291,113 units, Three-wheeler sales were 54,154 units and Two-wheeler sales were 1,577,694 units reported in October 2022.*

For the month of October 2022 the total two-wheelers sold in the Indian market were 1,577,694 units. This indicates an increase in two-wheelers retail in India by

5,31,320 units which translates to 51.09 percent year-on-year increase in total two-wheelers retail. For the month of October 2022 the total commercial vehicles sold in the Indian market were 74,443 units. This indicates an increase in total commercial vehicle retail in India by 15,080 units which translates to 25.40 percent year-on-year increase in total commercial vehicle retail. The figures for total commercial vehicles retailed in the Indian market for October 2021 stood at 59,363 units.

Commenting on October sales, Mr Vinod Aggarwal, President, SIAM said, "Good market sentiments coupled with festive boost, resulted in higher sales in October, especially for Passenger Vehicles. Higher inflation and rising interest rates have impacted the rural market more, thereby returning marginal growth of the Two-Wheeler segment. Passenger Three-Wheelers is seeing better off-take due to increased shared mobility in semi-urban and urban areas."

Commenting on Industry performance, Mr Rajesh Menon, Director General, SIAM said, "Though the Passenger Vehicles have reported highest ever domestic sales in April to October period, Sales of Two-Wheelers in these 7 months of 2022 is still lower than that of 2016, while for Three-Wheelers it is lower than 2010. Similarly, exports of Passenger Vehicles continued to grow, while there has been a drop in exports of both Two and Three-Wheelers." While commenting on how October'22 and Festive Period performed, FADA President, Manish Raj Singhania said, "Auto Retail for the month of October'22 saw an overall growth of 48%. With most of the month under festive period, the sentiments were extremely positive across all categories of Dealership outlets".



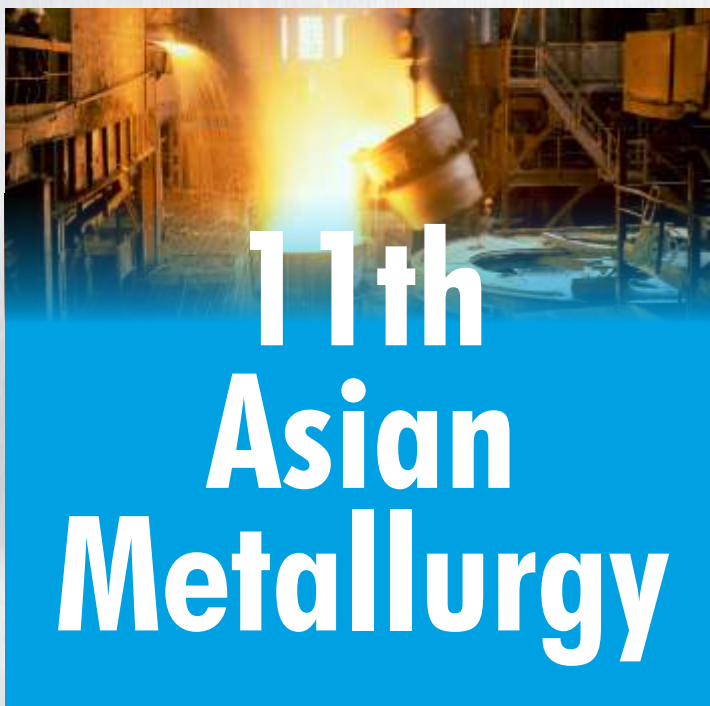


SIAM						
Segment wise Comparative Production, Domestic Sales & Exports data for the month of October 2022						
(Number of Vehicles)						
Category	Production		Domestic Sales		Exports	
Segment/Subsegment	October		October		October	
	2021	2022	2021	2022	2021	2022
Passenger Vehicles (PVs)*						
Passenger Cars	126,001	170,622	103,829	140,926	26,639	33,045
Utility Vehicles (UVs)	120,544	151,457	112,112	141,254	12,719	14,614
Vans	10,634	8,910	10,412	8,933	308	1
Total Passenger Vehicles (PVs)	257,179	330,989	226,353	291,113	39,666	47,660
Three Wheelers						
Passenger Carrier	61,198	73,253	21,408	41,246	41,844	34,038
Goods Carrier	10,453	9,936	9,048	10,326	852	217
E-Rickshaw	1,252	2,629	1,322	2,323	-	-
E-Cart	29	293	34	259	-	-
Total Three Wheelers	72,932	86,111	31,812	54,154	42,696	34,255
Two Wheelers						
Scooter/ Scooterette	481,616	514,292	479,459	512,761	38,619	30,151
Motorcycle/Step-Throughs	1,349,273	1,217,910	1,017,874	1,020,295	334,781	256,934
Mopeds	64,438	41,655	55,356	44,638	672	234
Total Two Wheelers	1,895,327	1,773,857	1,552,689	1,577,694	374,072	287,319
Quadricycle	269	133	2	71	264	84
Grand Total	2,225,707	2,191,090	1,810,856	1,923,032	456,698	369,318
* BMW, Mercedes, Tata Motors and Volvo Auto data is not available						
Society of Indian Automobile Manufacturers (11/11/2022)						

SIAM						
Summary Report: Cumulative Production, Domestic Sales & Exports data for the period of April-October 2022						
Report I						
(Number of Vehicles)						
Category	Production		Domestic Sales		Exports	
Segment/Subsegment	April-October		April-October		April-October	
	2021-22	2022-23	2021-22	2022-23	2021-22	2022-23
Passenger Vehicles (PVs)*						
Passenger Cars	987,848	1,261,022	784,959	1,020,880	208,888	234,745
Utility Vehicles (UVs)	884,238	1,262,751	765,803	1,123,710	114,219	133,177
Vans	64,678	83,617	63,305	83,263	1,193	591
Total Passenger Vehicles (PVs)	1,936,764	2,607,390	1,614,067	2,227,853	324,300	368,513
Three Wheelers						
Passenger Carrier	373,243	424,313	81,694	182,804	295,202	243,971
Goods Carrier	48,590	56,180	41,114	53,323	5,506	2,410
E-Rickshaw	4,020	12,784	4,272	12,749	-	-
E-Cart	184	1,932	183	1,890	-	-
Total Three Wheelers	426,037	495,209	127,263	250,766	300,708	246,381
Two Wheelers						
Scooter/ Scooterette	2,680,455	3,496,463	2,445,508	3,276,888	224,193	257,775
Motorcycle/Step-Throughs	7,646,846	8,497,931	5,369,358	6,427,012	2,387,679	2,132,607
Mopeds	303,980	264,100	287,915	272,258	7,534	1,782
Total Two Wheelers	10,631,281	12,258,494	8,102,781	9,976,158	2,619,406	2,392,164
Quadricycle	3,286	1,132	8	361	3,593	828
Grand Total	12,997,368	15,362,225	9,844,119	12,455,138	3,248,007	3,007,886
* BMW, Mercedes, Volvo Auto data is not available and Tata Motors data is available for Apr-Sep only						
Society of Indian Automobile Manufacturers (11/11/2022)						

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DELEGATES
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