METALWORLD

Devoted to Foundry & Non-Ferrous Metals Industry

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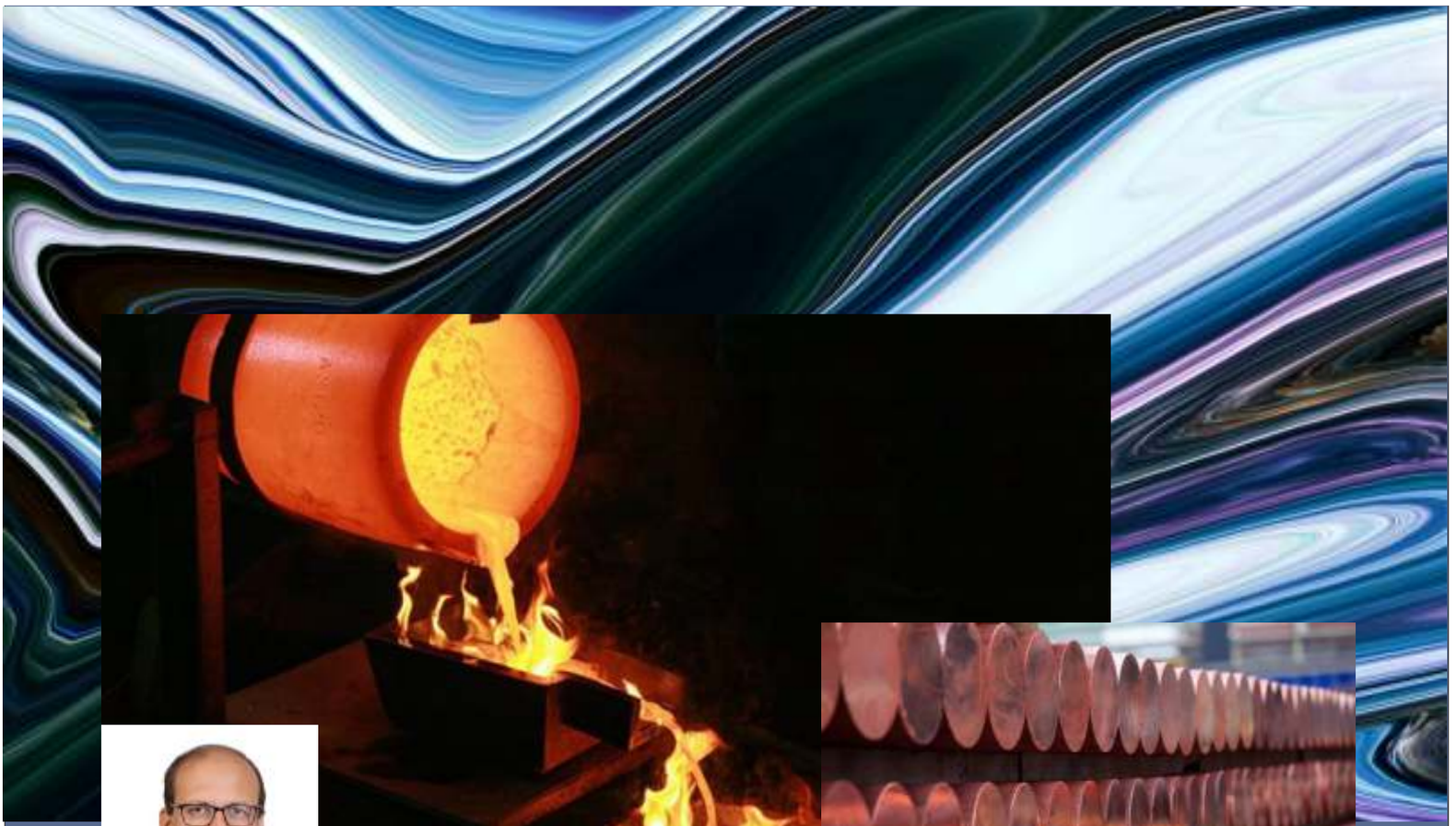

Udayan Pathak

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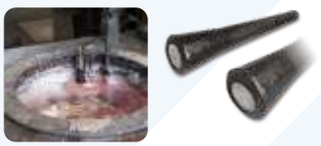

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D. A. Chandekar
Editor

Dear Readers,

When I wrote this piece for the last month's issue, I was in the best of the mood. Everything seemed to have fallen in place for the metals sector of the country. 'Rising demand and the strong prices' was the reflection of the industry sentiment prevailing at that time. In fact many metal producers recorded the highest ever production in the last quarter of the last fiscal. Indeed the industry was very well poised for a V shaped recovery.

Now after a month or so, is the situation unchanged ? Unfortunately the answer is 'No'. As we all know, the covid cases are increasing since last month. Many cities in the country are affected severely and had to follow strict restrictions and in few cases curfew or even lockdown. Yes, the second wave of corona has hit the country and medical experts say this is going to be more deadly than the first one. We are already witnessing huge number of per day cases in the cities like Mumbai, Pune, Delhi etc.

and many state governments have rightfully restricted the human movements.

With such dangerous situation unfolding, it is foolish to believe that our industry will remain bullish and will keep on growing in spite of the corona virus making in roads in the society on a large scale. How the industry can get affected ? Firstly, the production may get hit by two factors. One, by the spread of virus within the plant and second by migration of labour. Further, the logistics may also get affected due to non availability of manpower. As we all know, for a volume based industry like ours, logistics plays a very vital role. If the movement of raw materials and also the finished products is compromised, then the whole industry gets chocked up. This will in turn have a detrimental impact on the production as well.

Will this really happen ? Will the industry be shut as it was in the first wave ? I wish not but as is said, let us expect the best to happen and at the same time be prepared for the worst. One has to start preparing from now itself for a possible shut down or a reduced capacity utilisation. I do agree that now as a industry, as a nation and also as human race, we are now experienced enough to handle such situation and crisis. I am sure we will be the winners in this battle against this deadly virus. All the best !

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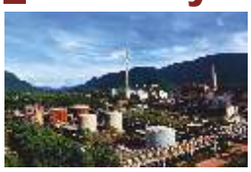

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Rising fuel costs will demand more and more lighter and efficient vehicles

"We are positive about the Automobile segment largely due to Government spending on Infrastructure which will boost the CV segment sales. In addition to this, customer buying pattern post Covid -19 pandemic in the PV segment preference for personal vehicles mainly on account of hygiene needs and spread of pandemic would be a another riding factor for the automobile demand" by Udayan Pathak, FIE, FASM and Ex-Head of Quality Engineering Research Centre, Tata Motors Pune

Udayan Pathak is the Fellow of Institution of Engineers (FIE) & American Society of Materials (FASM). He was Heading the World Class Quality Engineering Research Centre, Tata Motors Pune.

He has worked previously with John Deere, DGP Hnoday, Spicer India, Bharat Forge and Ruston & Hornsby India. His work is focussed on Sustainable Processes and usage of Lean alloys and environmental friendly materials including lubricants for Automotive.

He has more than 20 patents to his credit. He is mentoring Freshers & Mid Career professionals for advancement of their career. He is The Chairman, ASM International Pune Chapter.

DA Chandekar, Editor of Metalworld Magazine had an interaction with Udayan Pathak on the present status of Indian Automobile Industry and How the concept of EV and its impact on steel demand from the Automobile industry in the years to come.

Excerpts :

How much has the Auto Industry recovered after March 2020? What is the present status?

Looking at the past two years SIAM monthly data on Indian Automobile production and sales indicates that March 2020 passenger Vehicle sales was reported at 1,37,390 vehicles which was less than 52% as compared to its year ago level reported in March

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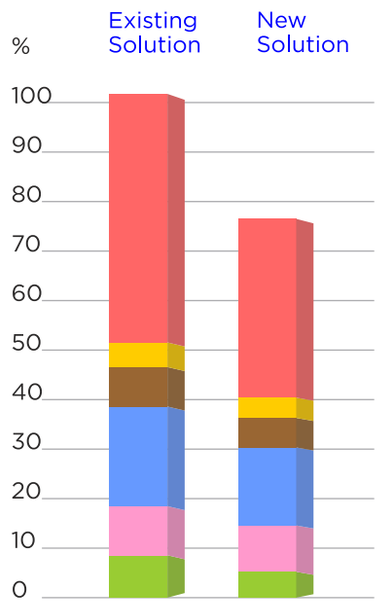

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2019). While in the Commercial Vehicle segment sales declined drastically upto 12,644 vehicles, almost 88% declined as compared to March 2019 level. This decline was largely due to changeover from BS4 compliant vehicles to BS6 compliant vehicles which means cost penalty. Also Covid-19 Pandemic situation also affected the sales. As compared to the above, vehicle sales reported in March 2021 are definitely better than past two years with an impressive growth of 128% i.e. Sales volumes of 3,20,487.

Tata Motors, Mahindra & Renault have recorded growth while others recorded decline. Income Tax benefit offered by FM, spent on goods and services with more than 12% GST was considered while offering tax free LTC helped industry despite rising Covid-19 cases.

In case of Commercial Vehicle segment though figures for India are not available till date, Tata Motors alone recorded sales of 36,955 units in March, up by 593%.

The overall market sentiments are positive. And Industry is on a faster recovery path.

How do you see the future of Indian Auto industry in India ? What are the challenges ahead?

We are positive about the Automobile segment largely due to Government spending on Infrastructure which will boost the CV segment sales.

In addition to this, customer buying pattern post Covid -19 pandemic in the PV segment preference for personal vehicles mainly on account of hygiene needs and spread of pandemic .Till last year customers were focusing on a shared mobility solution. Despite various efforts by service providers the confidence on shared mobility is at stake and people are again preferring personal vehicles. Of course, buying patterns will be favored for smaller cars. Keeping initial low cost is always a challenge for Indian Automotive Industry.

Rising fuel costs will demand more and more lighter and efficient vehicles. Also consciousness about stakeholders safety is also rising with more and more cars meeting 5 star EuroNcap safety ratings. Due to fluctuating demands, there will be a change in employment pattern with more focus on flexible aka temporary manpower.

How is the concept of EV progressing in the country? What is the situation on the ground ?

Electric Vehicles (EV) has better prospects in India. Today around 8 - 10 passenger vehicle models are available with cost varying from 4.5 lakh to 1.12 Cr INR. The availability of battery charging infrastructure is still a major issue. Also due to various reasons, variance in values reported under standard test conditions and actual performance is varying to a great extent. Many global OEMs have discontinued further development on IC engine-based Drive trains. Many Public Utility Corporations have migrated to EV Buses under FAME I & II Schemes. Even intercity electric buses are plying between Lucknow - Kanpur and Pune-Mumbai.

How will all this impact the steel demand for the auto industry ?

Although it will take a little more time to get a clear picture about adoption of Technology advances. Initial impact is clearly weight penalty due to higher battery & electric motor weight which can be compensated by special steels. However, there are limitations to reduce panel thickness because it may not meet stiffness requirements. More than electric vehicles, development of autonomous vehicles may reduce steel contet drastically. Since there will not be collisions, the need for HSS , UHSS etc is expected to come down drastically.

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Melting 4.0 – Digitalisation and Digital Control of The Melt Shop Operations in Foundries and Steel Mills

INTRODUCTION

Current situation in melt shop operations in the metals industry (casting, iron-and steelmaking, smelters, etc.) is diverse and fragmented. The melt shop is the LEAST digitalized area inside such company operations and provides huge potential for productivity improvements.

This paper combines an overview of foundry practices with digitalization solutions offered by modern software and hardware, resulting in what can be considered the state-of-the-art for melt shop operations management.

ABSTRACT

In melt shops a lot of money goes up in smoke every day. Literally. Optimum melt-shop operations combined with cost-effective material consumption, reduced re-alloying quantities and steps as well as shorter melting times determine just how economical a melt shop is or can be. Having efficient support for the melting process combined with well-functioning materials management and successful energy management systems are becoming more and more important as factors of success in metal casting operations.

Modern melt shop operations are nowadays digitally enhanced with advanced software systems and other solutions in order to create heightened efficiency and cost savings

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wherever possible. The melt shop has as mentioned before – among others – the highest digitalization potential among any metal operations and **FRP®.melt** is the solution to start out with supporting the entire value chain.

The considerable fluctuations in material prices and the increasing energy costs of recent years, combined with growing pressure on prices, emphasize the necessity to reorganize processes and to use existing resources in the most effective way.

In many (steel) foundries, ironworks, steelworks, heat-treatment applications, the IT-support for the melting / heating process, in contrast to other areas of production, is still a long way from achieving its full potential. Very often the level of industry is on a "2.0" infrastructure, thus very far away from the "Industry 4.0" concept of digitalization and deployment of cyber-physical systems.

In order to achieve the desired quality for melt shop operations, continuous and discontinuous processes have to be synchronized and process parameters within the individual manufacturing steps have to be aligned to each other.

This counts for traditional foundries just as much as modern steel manufacturing plants. What is mostly lacking is the ability to collect data and process the same through intelligent interfaces to a central database allowing for data driven decisions especially when it comes to melt quality in the right quantity under cost optimized conditions.

In addition, the heat-resistant sensoring technology hasn't matured yet to provide more than just "a temperature reading" so that multiple objectives can be met. Metals melting conditions are well above the 1000 degrees level and need to look at alternatives so that ultimately best melting practices become best – cost-optimized – melting furnace practices fully digitalized and ready at your fingertip.

FRP®.melt STEPS TOWARDS DIGITALISATION OF MELT SHOP OPERATIONS

How can FRP®.melt support melt shop operations?

The melt shop is the most important part of a foundry or ironworks or steelworks, for two important aspects: the alloying process takes place substantially here, the amount of energy involved is much bigger than in any of the downstream process steps. Actuals show that it comprises of up to 70% of total energy cost in a metal casting company.

The "melting process" makes a foundry unique in manufacturing, therefore it requires attention.

Evolutionary processes inside the melt-shop area allows creation of databases.

The melting and alloying process is in many foundries a well protected company secret it is the aim of **FRP®.melt** that this special Know-How must be preserved in form of a DB (database) and not merely in computer spread sheets or even paper.

FRP®.melt –SOFTWARE REQUIREMENTS AND SPECIFICATIONS

- Comprehensive planning of the melt process covering all melt and treatment steps – right through to the point when the charge or ladle is ready for pouring / tapping.
- Precise pre-calculations with material requirements calculations considering scrap, alloy components and metals are mandatory BEFORE the melting process starts.
- Optimization of material quantities for precise charging and re-charging (i.e. batching and re-batching).
- Shortened melting times and resulting from this increased

melting capacity by means of an integrated foundry information system displaying process instructions, furnace parameters, energy requirements (tracking) , analyses etc. directly at the furnace.

- **FRP®.melt** reduces energy requirements per ton and consequently reduces costs by supporting energy management at the point of highest consumption.
- Delivers traceability and process security by recording and archiving all process steps, analyses and consumptions within the melt report (audit-trail).
- Comprehensive evaluations possible in the form of web-based forms and reports.
- Links to analysis devices and furnace controls for improved process integration.
- Integration of third-party systems via standardized interfaces to maintain continuous mass and materials flow.

FRP®.melt is available within the **FRP®**– suite software system standard either as an add-on module or as a stand-alone solution with or without interfaces to third party systems. It is a detailed planning tool focusing on the melt shop and the furnace operators. If standalone the solution has a special starting level and it is desired to learn and upgrade over a period of time so every meltshop operation, be it small or large, can benefit from the same.

FRP®.melt OFFERS DIGITALIZATION STEP BY STEP

FRP®.melt is categorized into 3 different levels namely level M1 / level M2 and level M3: it is a staggered approach for digitalization using level M1 / M2 / M3 for easy starting point.

FRP®.melt - (level M1) is the starting level solution designed for creating a database and providing the ability for charge calculations.

It is the aim in this M1 – level to securely keep your know-how in form of a database (Step 1).
Further more to reduce cost where possible with every batch via creating „what if" calculations, e.g. Use FeNi instead of pure Ni briquettes when alloying. (Step 2). Last but not least, to calculate the cost of your standard batch (without actual prices from purchase) and to calculate the cost for actual batch (without materials management and without purchase items) (Step 3).

In this way you will be able to create your foundry master data.
Implementation / training efforts are minimal and will take merely 20 man-days of installation and commissioning activities thanks to standardized approach.

FRP®.melt– (level M2) is comprising of an advanced level of melt shop management in comparison to level M1. To implement **FRP®.melt**- level M2, we need to complete level M1 first as otherwise all the foundation items are missing.

Key add-on elements of **FRP®.melt**– level M2 are the following:

- Melting facilities - melting furnaces records, capacity, etc.
- Post charge calculation – re-alloying of melt, melt chemical actual analysis
- Melting report – charge calculation on basis of physically used / available material, different process status / levels, melt treatment
- Working staff details on the furnace
- Energy (kWh) consumption record per heat
- Selection of pouring ladles after tapping
- Standard print out of the FRP®- melting report
- Furnace lining heat

count record for better maintenance handling

- Online info of the melt – charge calculations, melting reports, etc.

Alternatively clients can choose to upgrade right away from level M1 to level M3 if desired, nevertheless the activities from level M2 need to be fulfilled.

FRP®.melt– (level M3) as described here after is for a professional melts hop management level implementation.

To implement **FRP®.melt-** level M3, all activities as defined under level M1 and level M2 must be completed.

Key add-on elements of **FRP®.melt–** level M3 in addition to level M1 and level M2 are as follows:

- With material management program- price sheets, purchase order, stock entry of purchase material (incoming goods), inventory card, stock dispatch, balance, inventory record keeping per stock entry with every new incoming material analysis
- Digital integration of spectrometer with system and mission critical information exchange – retrieve analysis directly from spectrometer to melting report, actual analysis of raw material, actual analysis of melt, post charge calculation.
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China March aluminium output climbs to monthly record

Primary aluminium output in China, the world's top aluminium producer, was up 8.5% year-on-year at 3.28 million tonnes last month, the National Bureau of Statistics said.

China aluminium rose in March from a year earlier to a monthly record, official data showed on Friday, despite curbs on energy use in the smelting hub of Inner Mongolia.
Primary aluminium output in China, the world's top aluminium producer, was up 8.5% year-on-year at 3.28 million tonnes last month, the National Bureau of Statistics said.
That beat the previous high for an individual month of 3.27 million tonnes, reached in December 2020.
Daily aluminium output, however, eased in March from the previous two months, Reuters calculations based on official data showed, dropping to around 105,800 tonnes of metal per day versus 109,300 tonnes per day for January-February, a record. The bureau combines data for the first two months of the year rather than publishing details for each month.
Inner Mongolia roiled markets last month after saying it would stop approving new projects for aluminium smelting, which is highly energy-intensive, while its largest city Baotou said it would shutter some industrial production and power plants to meet energy consumption targets.
Meanwhile, output of a group of 10 nonferrous metals - including copper, aluminium, lead, zinc and nickel - rose 12.7% year-on-year in March to 5.48 million tonnes, the bureau said.

RUSAL, a global aluminum producer, announces that it has successfully completed the acquisition of Aluminium Rheinfelden GmbH following approval by the German Federal Cartel Office and the German Federal Ministry for Economic Affairs and Energy.

Rio Tinto Achieves Battery Grade Lithium Production at Boron plant

Rio Tinto has commenced production of battery-grade lithium from waste rock at a lithium demonstration plant at the Boron mine site in California, United States. The demonstration plant is the next step in scaling up a breakthrough lithium production process developed at Boron, to recover the critical mineral and extract additional value out of waste piles from over 90 years of mining at the operation. An initial small-scale trial in 2019 successfully proved the process of roasting and leaching waste rock to recover high grades of lithium.

The demonstration plant has a design capacity of 10 tonnes per year of battery grade lithium. It will be run throughout 2021 to optimise the process and inform Rio Tinto's feasibility assessment for progressing to a production scale plant with an initial capacity of at least 5,000 tonnes per year, or enough to make batteries for approximately 70,000 electric vehicles.

Rio Tinto's lithium pipeline includes the Jadar lithium-borate project in Serbia, for which a feasibility study is expected to complete by the end of 2021.

Development of the lithium project at Boron draws on Rio Tinto's long standing partnership with the U.S. Department of Energy's Critical Materials Institute, which is focussed on discovering ways to economically recover critical mineral by-products from existing refining and smelting processes. CMI experts worked alongside Rio Tinto technical leads to help solve a number of key processing challenges to produce battery grade lithium at Boron.

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China's Copper Imports to Fall in 2021

As per the recent report China's China Non-ferrous Metals Industry Association research house Antaike said that China's refined copper imports are expected to fall by around 27% in 2021 from last year's bumper levels.

After last year's unprecedented purchases, imports will return to a reasonable level this year, he said. The arbitrage window has closed and Antaike expects China's own refined copper production to increase in 2021. Antaike sees refined copper imports totalling 3.4 million tonnes in 2021, down 27.2% from 4.67 million tonnes in 2020

Top metals consumer China imported record amounts of copper and aluminium in 2020 as a rapid demand recovery from the impact of COVID-19 pushed Chinese metal prices above international prices, opening up an arbitrage for cheaper overseas metal to flow in.

Antaike sees China's refined copper consumption rising 3.7% this

RUSAL completes acquisition of Aluminium Rheinfelden

RUSAL, a global aluminum producer, announces that it has successfully completed the acquisition of Aluminium Rheinfelden GmbH following approval by the German Federal Cartel Office and the German Federal Ministry for Economic Affairs and Energy.

The transaction ensures that operations can continue and delivers job security for more than 200 highly qualified employees of Aluminium Rheinfelden. The acquisition reinforces RUSAL's position as the supplier of choice to its international network of automotive customers and is expected to deliver strong commercial synergies by matching Aluminium Rheinfelden's high end, niche product focus with RUSAL's global scale low-carbon aluminum alloy production. Eric Martinet, Automotive and Transportation Director at RUSAL has been announced as the new CEO of Aluminium Rheinfelden.

National Aluminium Co gets mining lease for Utkal-E coal block in Odisha

National Aluminium Company Ltd (Nalco) has been granted the mining lease of Utkal-E coal block in Odisha as per the Department of Steel & Mines, Government of Odisha, through a notification issued on April 12.

As per the notification, the mining lease of Utkal-E coal block is over an area of 523.73 hectare, the company said in a filing to BSE.

The initial capacity of the block is 2 million tonnes per year with a total mineable reserve of approximately 70 million tonne. Nalco has already executed the mining lease for Utkal-D coal block in March 2021.

With the grant of Utkal D & E coal blocks, the total mineable coal reserve of the company will be 175 million tonnes, which will be pivotal in meeting the coal requirement of its captive power plant at Angul, Odisha.

Sridhar Patra, CMD of the company said the NALCOteam is extremely optimistic on starting the mining operation from Utkal-D coal block in this financial year.

"With the grant of the mining lease of Utkal E coal block, the planned expansion activities of the company will get a boost and will contribute significantly to the bottom line of Nalco," he said.

Initially, Nalcowill be able to produce four million tonne coal per year from the operation of Utkal-D & E coal blocks. The lease for these two coal blocks has been granted to the PSU for a period of 30 years.

Govt makes import registration compulsory for host of aluminium, copper products

In line with the import monitoring system for steel and coal, the government has decided to put in place a mechanism to monitor imports of aluminium and copper to capture disaggregated data for effective monitoring and policy intervention.

The directorate general of foreign trade (DGFT) has said in a notification that the import policy for copper and aluminium has been amended from "free" to "free with compulsory registration" under the non-ferrous metal import monitoring system (NFMIMS).

Rahul Sharma, president of the Aluminium Association of India, said, "We welcome the move. It will be helpful for the industry. Similar models are there in the US and Canada as well. NFMIMS will help effective monitoring of imports and policy intervention. This will support the government's 'Make in India' initiative."

Sharma, who is also deputy CEO, aluminium business, at Vedanta, said NFMIMS would cover 99.5% imports of aluminium, currently valued at `35,000 crore.

The government's decision to launch a mechanism similar to the one for the steel sector will help domestic producers of non-ferrous metal such as Vedanta, Nalco, Hindalco and Hindustan Copper chalk out strategies to substitute imports.

"NFMIMS shall require importers to submit advance information in an online system for imports of copper and aluminium and obtain an automatic registration number by paying a registration fee of Rs 500," the DGFT said in a notification.

Under NFMIMS, the importer can apply for registration not earlier than the 60th day and not later than the fifth day before the expected date of arrival of the import consignment. The automatic number shall remain valid for 75 days.

The importer shall have to enter the registration number and expiry date for registration in the Bill of Entry to enable customs for clearance of the consignment, the notification said.

Adani Enterprises enters copper business, incorporates Kutch Copper Limited

Adani Enterprises, the flagship entity of the Adani Group, Thursday announced its entry into the copper business by incorporating a wholly-owned subsidiary, Kutch Copper Limited (KCL).

"KCL is incorporated with the object to undertake copper business-related activities, such as the manufacture of copper cathodes and copper rods and more," the company said in a filing with exchanges.

Gautam Adani-led Adani Enterprises owns businesses such as Adani Ports and Special Economic Zone Limited, Adani Power, Adani Transmission, Adani Green Energy and Adani Gas. All these companies are independently listed on the stock exchanges.

The company's entry into the copper business comes at a time when the import of refined copper has increased to 92,990 tonnes in FY19, from 44,245 tonnes in FY18.

In a written response in the Lok Sabha, Union Minister of Mines, Coal and Parliamentary Affairs Pralhad Joshi said that the "imports of refined copper trebled from 44,245 tonnes to 1.52 lakh tonne in FY18-FY20, while exports slid 90% from 3.8 lakh tonne to 39,959 tonnes.

As per industry data, India's refined copper production was about 848,000 tonne in 2017-18. In 2019-20, the country's production of refined copper dropped to 408,000 tonne.

The move also comes at a time when the commodity is in a super cycle, with prices at the London Metal Exchange (LME) hitting a near-decade high of $9,617 per tonne in February. The prices have more than doubled from March 2020.

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Anil Agarwal's Vedanta plans new $1.4 billion copper smelter in India

Anil Agarwal's Vedanta Ltd. is scouting for locations to set up a new copper smelter in India as its plant in the southern state of Tamil Nadu has remained shuttered for close to three years.

The Mumbai-based company is seeking expressions of interest from state governments of coastal Indian states to partner with it for setting up a 500,000 tons-a-year copper smelter complex at a potential investment of around 100 billion rupees ($1.4 billion), it said in a newspaper advertisement. The project will require about 1,000 acres (4.0469 square kilometers) of land close to a port along with logistics connectivity, it said.

Vedanta has fought multiple court battles to restart production at its 400,000 tons copper factory in Tuticorin. The plant has been closed since 2018 on orders from the state government after more than a dozen people were shot dead by the police while protesting against pollution from the facility. A fresh plea to restart the smelter is pending in India's top court.

Agarwal's move comes as copper prices rallied to a nine-year high in February on expectations of higher demand due to a global economic recovery and green initiatives. While the rally has faltered in recent weeks on rising inventories and renewed coronavirus lockdowns in Europe, the additional capacity would ease India's trade expenditure and improve supplies locally.

“India's copper requirements are set to grow exponentially in the coming years," Vedanta said in an emailed statement. “Having ample supplies of copper is critical to ensuring successful implementation of new-gen technologies such as electric vehicles, rapid automated transport and clean energy."

Closure of Sterlite Copper turns India into a net importer of refined copper

The closure of Vedanta Ltd's Tuticorin copper smelter in May 2018 has turned India into a net importer of refined copper, according to newly released government data.

While India was a net exporter of refined copper to the extent of 3.34 lakh tonnes in the year ended March 2018 (prior to the shut down); the country has turned into a net importer since then.

India was a net importer of 44,373 tonnes of refined copper in the year ended March 2019, while imports rose to 1.15 lakh tonnes in the year ended March 2020.

This is primarily on account of the shutdown of a huge plant in Tuticorin in Tamil Nadu due to pollution and health concerns in May 2018.

The Sterlite Copper plant of Vedanta Ltd used to single-handedly produce around 4 lakh tonnes of copper — or about half the total refined copper produced in India.

The country's production of refined copper — used for industrial uses as well as for wiring and other electrical applications — halved to 4.1 lakh tonnes in FY2019-20 from 8.3 lakh tonnes in the year before the plant was shut down.

The plant was originally supposed to have been set up in Zadgaon in Ratnagiri district in Maharashtra. However, it was moved to Tuticorin in Tamil Nadu following local opposition.

The plant functioned for around 21 years, from 1998 to 2018, but was shut down due to widespread protests by locals alleging ground water and air pollution.

Hindustan Copper raises Rs 500 cr from institutional investors

Hindustan Copper said it raised 500 crore by selling shares to institutional investors.

The qualified institutions placement (QIP) closed on April 12 with wide participation from investors including mutual funds, insurance companies, banks and foreign institutional investors, the company said in a statement on Thursday. The offer was fully subscribed, it said.

QIP allows a company to raise money from the domestic market without the need to submit any pre-issue filings to regulatators like the Securities and Exchange Board of India.

This is the first time a central public sector enterprise raised funds through a QIP, the statement said.

The proceeds are proposed to be used to fund the ongoing capital expenditure and expansion plan of the company.

Hindustan Copper is a producer of primary refined copper in India. In the coming months, it plans to expand ore production from 3.97 million tonnes per annum to 12.2 million tonnes in phase-I (under i ..

CSR: Hindalco's immunisation drive benefitted 14,000 people of 12 villages of Hirakud

The PPP (Public-Private-Partnership) mode has taken on an altogether new dimension in Hirakud in Sambalpur District, especially at a time when healthcare is on top of the government's policy checklist.

Hindalco, the flagship of the Aditya Birla Group, in partnership with the Govt. Hirakud Hospital Sambalpur has taken a number ofimmunisation initiatives to ensure better and more meaningful lives for locals.

Till date, this combined initiative has benefitted around 14,000 people of adjacent 12 villages of Hirakud, the company said.

Besides, this partnership with the Hirakud hospital, has been very successful for conducting family planning operation camps and cataract surgeries for senior citizens in Hirakud and adjoining areas of the Sambalpur district.

The programme thus far has seen close to 150 vision care camps and over 300 health camps at the Hirakud Hospital during the past 3 years. At health camps the need for looking at children not merely as bundles of joy but also a responsibility to raise them, ensure their health and education. Several couples gained from the insights given on how to plan families.

The joint initiative of immunization has benefitted each and every child of the area. Every Friday, babies are administered immunisation in the immunisation cell attached to the company's Community Health Centre (CHC). The basic idea behind all this is simple: A healthy baby is a precursor to a healthy society. And Hindalco swears by this truism, the company informed.

ALCOA's strong Q1CY21 augurs well for Hindalco, NALCO, Vedanta; here's why

lobal aluminium major, ALCOA, has reported strong earnings for Q1CY21, which is positive for the industry.

The bauxite, alumina and aluminium products company reported first-quarter earnings of USD 175 million.On a per-share basis, the Pittsburgh-based company said it had profit of 93 cents. Earnings, adjusted for non-recurring gains, were 79 cents per share.

The results surpassed Wall Street expectations. The average estimate of four analysts surveyed by Zacks Investment Research was for earnings of 48 cents per share.Revenue came in at USD 2.87 billion in the period.

The reason why this is a positive breakthrough for a lot of Indian aluminium companies like Hindalco, NALCO as well as Vedanta is that ALCOA's performance is driven by higher global aluminium and alumina prices. This should hold true for the domestic industry as well.

"Expects to see continued global economic recovery. Increased demand for aluminium in end markets witnessed. There has been an improvement in shipments for value-added products. (sic)" the company said after the earnings.

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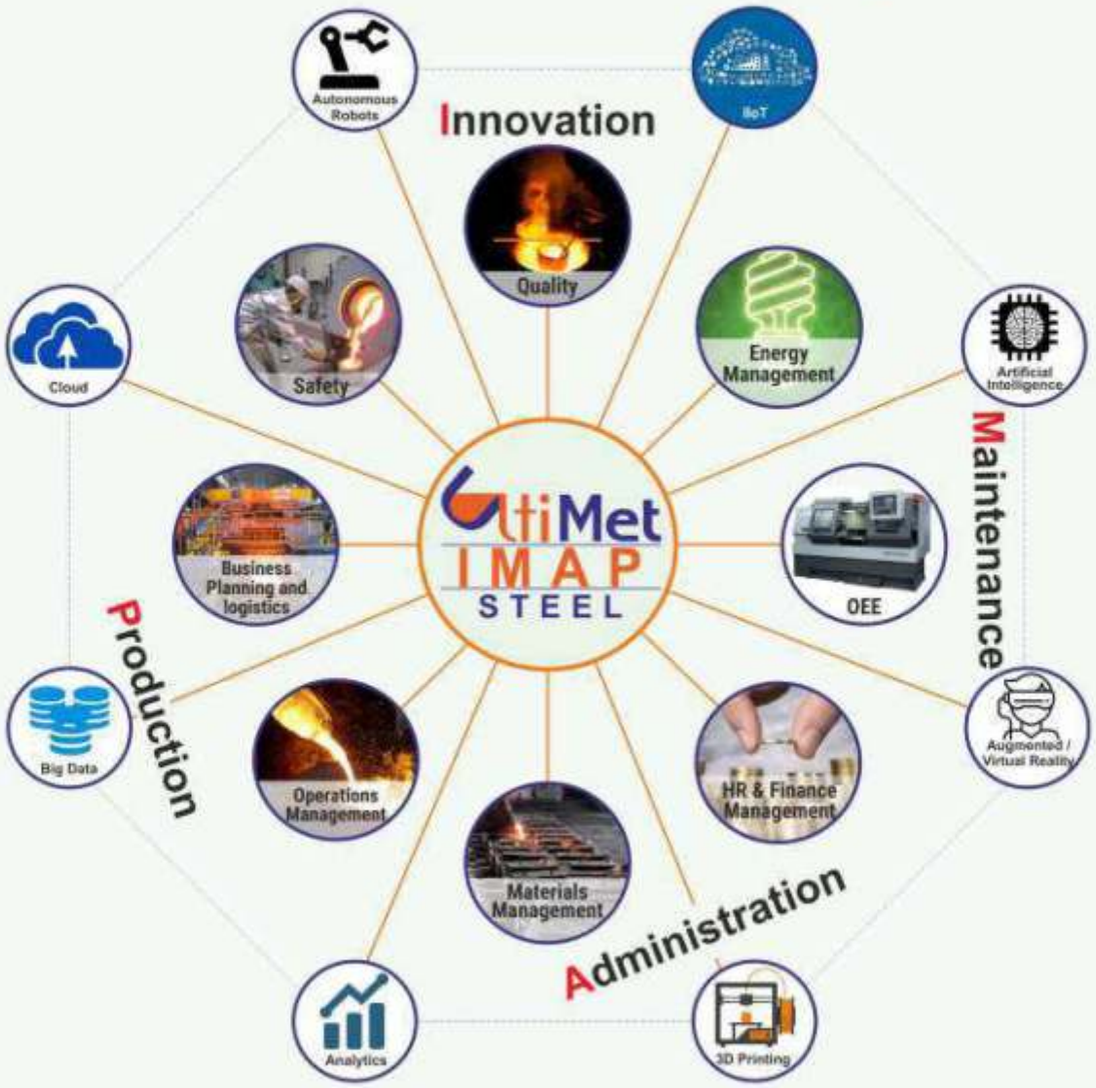

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BALCO's 'Arogya Project' benefitted more than 22,000 villagers through rural health initiatives

Bharat Aluminium Company (BALCO), India's iconic aluminium producer is playing a crucial role in the prevention of various diseases, especially Covid-19 in the rural regions of the state through its 'Vedanta Rural Hospital'. Under BALCO's CSR project 'Arogya', hospitals have been established in the villages of Chuhiya & Parsabhata located in the Korba region.

During 2020-21, more than 22000 villagers were benefitted through the various medical facilities provided by the Arogya Project. Through these hospitals, free medicines are being distributed to the villagers, awareness campaign on the pandemic and health consultation are being provided by the medical teams.

The aim of establishing Vedanta rural hospitals is to spread health awareness amongst the masses. BALCO has been instrumental in changing lives through this campaign. Vedanta Rural Hospital has come out as a ray of hope for around 60,000 citizens living in the vicinity of the plant. One of the major achievements of Vedanta rural hospitals has been that villagers now have proper access to doctors and medicines. These hospitals are playing a major role in spreading awareness about COVID-19 and its prevention. The villagers have been familiarized with social distancing, the importance of frequent hand washing, and use of sanitizers.

Abhijit Pati, CEO & Director BALCO said, "In the current challenging times of the pandemic citizens must take care of themselves and the health of their family members. BALCO has witnessed unprecedented success in the implementation of the Arogya Project and is proud that the project is adhering to the goals of community health. Villagers are now aware of maintaining hygiene and cleanliness in their surroundings. Vedanta Rural Hospitals are now providing information related to the prevention of the coronavirus. BALCO is to extend all possible help to the villagers in the prevention of Covid-19."

The villagers have access to first aid and hospital services within their villages, which saves them time and from the inconvenience of commuting to BALCO or Korba. The Vedanta rural hospitals have also been the tools to serve national campaigns such as those for vaccinations and maternal and child health protection. In coordination with the District health department, Vedanta rural hospitals is running awareness programs for Tuberculosis and HIV Aids also. These hospitals are also equipped with pathology labs to check for malaria and other diseases.

Shivraj Singh, Sarpanch, Village Chuiya, shared that BALCO is making a commendable contribution towards the availability of medical facilities in the villages. Presently, the villagers are receiving help through the rescue and awareness programs run by the rural hospital. He also added that the hospitals provide information regarding seasonal diseases, health camps are a big part of the project which is diligently set up by the hospital and the villagers are happy to have a medical facility in their village.

Copper prices to increase like gold by 2030 : Goldman Sachs

The 2020s are expected to be the strongest phase of volume growth in global copper demand in history, as per Goldman Sachs.

The 2020s are expected to be the strongest phase of volume growth in global copper demand in history, as per the recent report from Goldman Sachs.

Goldman Sachs has argued that the critical role copper will play in achieving the Paris climate goals cannot be understated. Without serious advancements in carbon capture and storage technology in the coming years, the entire path to net zero emissions will have to come from abatement - electrification and renewable energy.

As the most cost-effective conductive material,

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copper sits at the heart of capturing, storing and transporting these new sources of energy. In fact, discussions of peak oil demand overlook the fact that without a surge in the use of copper and other key metals, the substitution of renewables for oil will not happen, the report said.

It added that moving the global economy toward net

zero emissions remains a core driver of the structural bull market in commodities demand, in which green metals - copper in particular - are critical.

Copper has the necessary physical properties to transform and transmit these sources of energy to their useful final state, such as moving a vehicle or heating a home, the report said.

"Leveraging our equity analysts' carbonomics analysis across EVs, wind, solar, and battery technology, we quantify this demand in a bottom-up model, estimating that by 2030, copper demand from the transition will grow nearly 600 per cent to 5.4Mt in our base case and 900 per cent to 8.7Mt in the case of hyper adoption of green technologies", Goldman Sachs said.

"We estimate that by-mid decade this growth in green demand alone will match, and then quickly surpass, the incremental demand China generated during the 2000s. Ripple effects into non-green channels mean the 2020s are expected to be the strongest phase of volume growth in global copper demand in history", it added.

The copper market as it currently stands is not prepared for this demand environment.

"Moreover, a decade of poor returns and ESG concerns have curtailed investment in future supply growth, bringing the market the closest it's ever been to peak supply. Indeed, we see the copper market sleepwalking to a classic case of the "Revenge of the old economy", just as oil did during the 2000s commodity boom", the report said.

It added that the mining sector remains wary of a pivot towards growth after the price collapse in the mid-2010s severely punished any front-footed producers. Even as copper prices have rallied 80 per cent over the last 12 months, there have been no material greenfield project approvals.

The present corona virus epidemic has only compounded this dynamic, creating enough uncertainty to freeze companies' investment decisions. This combination of surging demand and sticky supply has reinforced current deficit conditions and foreshadows large open-ended deficits from mid-decade. We now estimate a long-term supply gap of 8.2Mt by 2030, twice the size of the gap that triggered the bull market in copper in the early 2000s, it added.

The report projects that copper is on a necessary path to $15,000 per ton. "We believe that the most probable path for copper price from here - that both avoids depletion risk and as well as a sharp surplus swing - is to trend into the mid-teens by mid-decade", Goldman Sachs said.

"We now project copper to average $9,675/t in 2021, $11,875/t in 2022, $12,000/t in 2023 before a material step-up to $14,000/t in 2024 and $15,000/t in 2025. In this context, we upgrade our 12-month target to $11,000/t", it said.

Vedanta signs MoU for value-creation from bauxite residue

Globally Red mud is an undesirable aspect in the production of an important and lucrative metal. Worldwide aluminium metal and its alloys are finding increasing applications in replacing iron , wood and plastics which are used in consumer goods. There are nearly 3,000 applications of aluminium in the international market.

However, in India this versatile metal is being used for only about 200 items. Per capita consumption of the metal in India is about 0.5 kg which is quite low compared to USA (27.5 kg) and Japan (29.4 kg). With development the market for aluminium is bound to grow. The light weight and recyclability makes aluminium a particularly attractive material. However, aluminium production is tinted with red mud generation which poses a complex technological challenge.

Recently Vedanta group has signed an MoU for value-creation from bauxite residue

Metalworld Research Team

(red mud), which is a by-product generated during processing of bauxite into alumina using the Bayer process. Bauxite is the primary ore for aluminium, that undergoes an intermediate refining stage to produce alumina, which then undergoes electrolysis for producing aluminium.

It is abundantly available on earth's crust, mining of bauxite is one of the most inherently sustainable mining processes. Approximately three tonnes of bauxite produce one

tonne of alumina, and around two tonnes of alumina are required to produce one tonne of aluminium.

Bauxite residue has many metal values like iron, alumina, rare earth elements (REE) and titanium dioxide. Creating indigenous capabilities for extraction of REEs from bauxite residue has been the brainchild of NITI Aayog, given the importance of Scandium for defence and its scarce availability in India which resulted in import dependency.

As it is a voluminous by-product, bauxite residue requires scientific ways of managing it, and even more advanced methodologies to extract commercial value from it.

Along with peer aluminium producers, Vedanta has entered into the partnership with three research institutes namely CSIR-National Metallurgical Laboratory (NML), Jamshedpur; Institute of Minerals and Materials Technology (IMMT), Bhubaneswar; and Jawaharlal Nehru Aluminium Research, Development & Design Centre (JNARDDC), Nagpur. As part of this, all three research institutes shall work together to develop technologies for bauxite residue utilization, like red mud beneficiation for REE enrichment, recovery of alumina values, recovery of iron values and process for extraction and separation of titanium and REEs (La, Ce, Y, Sc). Once established, the processes will be validated through an integrated facility.

Dr Indranil Chattoraj, Director, CSIR-NML said that every year India generates 9 million tonnes of red mud, which is dumped in ponds causing environmental load.

Dr Sanjay Kumar, Head, Metal Extraction & Recycling Division informed that various technology will be developed for red mud utilization under this national program, namely (a) red mud beneficiation for REE enrichment b) Recovery of alumina values c) Recovery of iron values d) Process for extraction and separation of Ti and REEs (La, Ce, Y, Sc) . The processes once established, will be validated through an integrated facility.

Rahul Sharma, dy CEO – aluminium, Vedanta, said, "Our world-class operations are guided by the sustainability tenets of 'Zero Harm, Zero Waste and Zero Discharge'. Implementing new age solutions for efficient waste management and creation of circular economy is ingrained in our decision-making process.

In addition to the initiatives already being taken towards ensuring a healthy environment through sustainable ways of working, Vedanta's robust waste management system and zero discharge mechanisms have set benchmarks in the global alumina refining sector. Under this MoU, we aim to maximize value-extraction from bauxite residue for further usage downstream."

Globally, as the quest for value-creation from by-products for a circular economy picks momentum, Vedanta has emerged as a trend-setter in the field of alumina refining in terms of by-product reduction and utilization. Innovation has been one of the key pillars in the success of Vedanta Aluminium's growth story in Lanjigarh (Kalahandi district, Odisha). Since the commencement of operations in the Indian aluminium sector, Vedanta's Lanjigarh refinery has rapidly evolved technologically into becoming one of the world's most advanced alumina refineries.

In 2013, Vedanta had put in place Red Mud Filtration, a first-of-its-kind process for dry handling of bauxite reside in the alumina refining industry. In 2020, the company piloted the Wick Drain project, a new-age waste management system, for even better handling of residue and efficient land usage. Parallelly, it is also working on other avenues to best utilize bauxite residue like cement and brick manufacturing, road construction, backfilling of depleted mine voids, etc.

SIAM Annual Statistic

"In the financial year FY20-21, there was a de-growth in sales of all segments compared to the previous years. (-) 2.24% for Passenger Vehicles with sales of 27.11 Lakhs units; (-) 13.19% for Two-Wheelers with sales of 151.19 Lakhs units; (-) 20.77% for Commercial Vehicles with sales 5.69 Lakhs units and (-) 66.06% for Three-Wheelers with sales of 2.16 Lakhs units.

If we look at the fourth Quarter Jan-March 2021 sales which might include some deferred sales from previous quarters, only passenger vehicle segment at 9.34 lac sales was marginally above the previous high of Jan-March 2018 at 8.62 lacs. Commercial vehicles sales at 2.10 lacs in Jan-March 2021 were below 2.82 lacs in Jan-March 2018. Similarly, Two-wheeler sales in Jan-March 2021 stood at 43.54 lacs against Jan-March 2018 figures of 51.13 lacs. Three-wheeler segment was the worst-hit with a sales of 0.86 lacs in this quarter compared to 1.97 lacs in Jan-March 2018."

Rajesh Menon,
Director General, SIAM

"Indian Automobile Industry continues to work hard, amidst the challenges of COVID second wave, to maximise production and sales, while ensuring safety of its people, partners and customers. We would like to thank and compliment the Government for a massive nation-wide vaccination drive and also for allowing vaccination of our employees in the factory premises.

On the sales front, a deep structural slowdown in the industry even before the pandemic, combined with the impact of COVID-19 in 2020-21, has pushed all vehicle segments back by many years. Recovery from here will require time and efforts, by all stakeholders. There is uncertainty in the value chain owing to semiconductors, lockdowns and raw material. In an environment of uncertainty, instead of trying to predict the future, we will all work hard to create it."

Kenichi Ayukawa,
President, SIAM

DOMESTIC SALES PERFORMANCE

(Sales Figures in 000')

MONTHLY

	Mar-18	Mar-19	Mar-20	Mar-21	CAGR %
PVs*	278	272	135	291	1.5
3Ws	72	66	28	32	-23.7
2Ws	1,742	1,441	867	1,497	-4.9

QUARTERLY

	Jan-Mar				
	FY 18	FY 19	FY 20	FY 21	CAGR %
PVs	862	844	656	934	2.7
CVs	282	284	147	210	-9.4
3Ws	197	180	130	86	-24.1
2Ws	5,113	4,653	3,503	4,354	-5.2

ANNUAL

	Apr-Mar				
	FY 18	FY 19	FY 20	FY 21	CAGR %
PVs	3,289	3,377	2,774	2,711	-6.2
CVs	857	1,007	718	569	-12.8
3Ws	636	701	637	216	-30.2
2Ws	20,200	21,180	17,416	15,119	-9.2

**Tata Motors Data Not Included*

Domestic Sales: April 2020 – March 2021 – Comparison with Past Years

(Numbers in '000)

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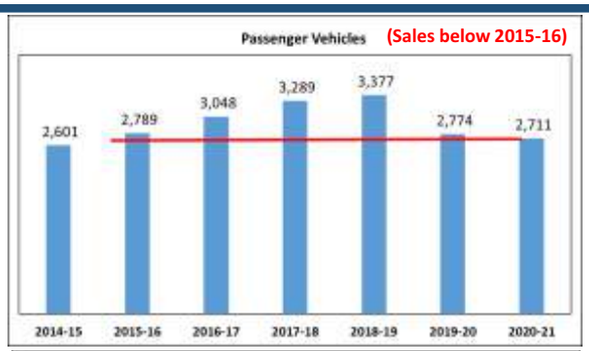

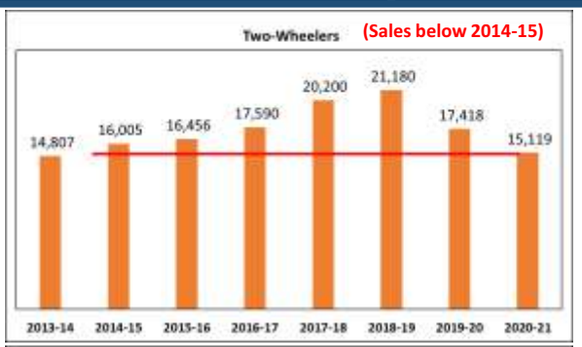

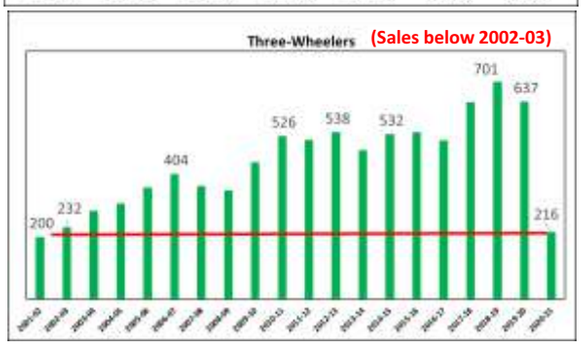

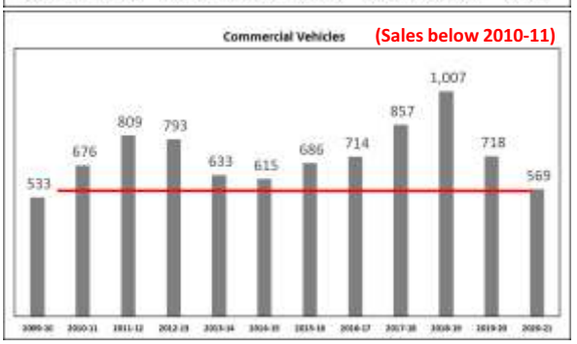

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Summary Report: Cumulative Production, Domestic Sales & Exports data for the period of April-March 2021 with % Change									
								Report I (Number of Vehicles)	
Category	**Production**			**Domestic Sales**			**Exports**		
Segment/Subsegment	**April-March**			**April-March**			**April-March**		
	2019-2020	**2020-2021**	**% Change**	**2019-2020**	**2020-2021**	**% Change**	**2019-2020**	**2020-2021**	**% Change**
Passenger Vehicles (PVs)*									
Passenger Cars	2,156,868	1,772,972	-17.80	1,695,436	1,541,866	-9.06	475,801	264,927	-44.32
Utility Vehicles(UVs)	1,136,209	1,182,085	4.04	945,959	1,060,750	12.13	183,468	137,825	-24.88
Vans	131,487	107,164	-18.50	132,124	108,841	-17.62	2,849	1,648	-42.16
Total Passenger Vehicles (PVs)	**3,424,564**	**3,062,221**	**-10.58**	**2,773,519**	**2,711,457**	**-2.24**	**662,118**	**404,400**	**-38.92**
Commercial Vehicles (CVs)									
M&HCVs									
Passenger Carrier	44,289	10,010	-77.40	40,016	7,322	-81.70	7,859	4,040	-48.59
Goods Carrier	188,125	171,232	-8.98	184,412	153,366	-16.84	14,474	13,508	-6.67
Total M&HCVs	**232,414**	**181,242**	**-22.02**	**224,428**	**160,688**	**-28.40**	**22,333**	**17,548**	**-21.43**
LCVs									
Passenger Carrier	45,291	15,475	-65.83	45,814	12,088	-73.62	4,300	1,641	-61.84
Goods Carrier	479,020	428,222	-10.60	447,351	395,783	-11.53	33,746	31,145	-7.71
Total LCVs	**524,311**	**443,697**	**-15.38**	**493,165**	**407,871**	**-17.30**	**38,046**	**32,786**	**-13.83**
Total Commercial Vehicles (CVs)	**756,725**	**624,939**	**-17.42**	**717,593**	**568,559**	**-20.77**	**60,379**	**50,334**	**-16.64**
Three Wheelers									
Passenger Carrier	1,016,261	521,918	-48.64	525,532	134,087	-74.49	495,278	387,337	-21.79
Goods Carrier	116,721	89,253	-23.53	111,533	82,110	-26.38	6,373	5,604	-12.07
Total Three Wheelers	**1,132,982**	**611,171**	**-46.06**	**637,065**	**216,197**	**-66.06**	**501,651**	**392,941**	**-21.67**
Two Wheelers									
Scooter/ Scooterettee	6,026,741	4,556,398	-24.40	5,565,684	4,479,848	-19.51	369,998	231,972	-37.30
Motorcycle/Step-Throughs	14,356,051	13,154,501	-8.37	11,213,662	10,019,836	-10.65	3,135,548	3,037,439	-3.13
Mopeds	649,678	636,218	-2.07	636,812	617,247	-3.07	13,859	8,313	-40.02
Electric Two Wheelers	457	2,824	517.94	274	2,456	796.35	0	0	-
Total Two Wheelers	**21,032,927**	**18,349,941**	**-12.76**	**17,416,432**	**15,119,387**	**-13.19**	**3,519,405**	**3,277,724**	**-6.87**
Quadricycle	6,095	3,836	-37.06	942	-12	-101.27	5,185	3,529	-31.94
Grand Total of All Categories	**26,353,293**	**22,652,108**	**-14.04**	**21,545,551**	**18,615,588**	**-13.60**	**4,748,738**	**4,128,928**	**-13.05**

*** BMW, Mercedes and Volvo Auto data is not available**

SIAM						
Segment wise Comparative Production, Domestic Sales & Exports data for the month of March 2021						
						(Number of Vehicles)
Category	Production		Domestic Sales		Exports	
Segment/Subsegment	March		March		March	
	2020	2021	2020	2021	2020	2021
Passenger Vehicles (PVs)*						
Passenger Cars	111,782	190,588	80,727	156,985	17,450	25,909
Utility Vehicles(UVs)	73,870	141,704	48,291	122,350	16,796	13,992
Vans	7,009	12,057	6,178	11,604	57	282
Total Passenger Vehicles (PVs)	**192,661**	**344,349**	**135,196**	**290,939**	**34,303**	**40,183**
Three Wheelers						
Passenger Carrier	54,325	62,589	22,215	21,614	25,751	38,767
Goods Carrier	5,488	11,142	5,393	10,316	148	1,005
Total Three Wheelers	**59,813**	**73,731**	**27,608**	**31,930**	**25,899**	**39,772**
Two Wheelers						
Scooter/ Scooterettee	331,710	518,395	263,070	457,677	22,801	27,883
Motorcycle/Step-Throughs	787,209	1,381,625	570,858	993,996	195,211	327,347
Mopeds	42,825	50,135	32,808	44,688	316	942
Electric Two Wheelers	82	666	109	445	0	0
Total Two Wheelers	**1,161,826**	**1,950,821**	**866,845**	**1,496,806**	**218,328**	**356,172**
Quadricycle	453	336	-131	7	216	270
Grand Total of All Categories	**1,414,753**	**2,369,237**	**1,029,518**	**1,819,682**	**278,746**	**436,397**

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

SIAM									
Summary Report: Cumulative Production, Domestic Sales & Exports data for the period of January-March 2021 with % Change									
									(Number of Vehicles)
Category	Production			Domestic Sales			Exports		
Segment/Subsegment	January-March			January-March			January-March		
	2019-2020	2020-2021	% Change	2019-2020	2020-2021	% Change	2019-2020	2020-2021	% Change
Passenger Vehicles (PVs)*									
Passenger Cars	513,129	594,030	15.77	404,202	513,765	27.11	71,126	74,315	4.48
Utility Vehicles(UVs)	283,523	425,250	49.99	220,309	383,643	74.14	50,146	38,141	-23.94
Vans	33,907	37,025	9.20	31,088	36,175	16.36	575	771	34.09
Total Passenger Vehicles (PVs)	**830,559**	**1,056,305**	**27.18**	**655,599**	**933,583**	**42.40**	**121,847**	**113,227**	**-7.07**
Commercial Vehicles (CVs)									
M&HCVs									
Passenger Carrier	10,735	4,943	-53.95	10,810	4,744	-56.11	1,974	1,211	-38.65
Goods Carrier	33,966	82,622	143.25	37,730	75,790	100.87	3,346	6,593	97.04
Total M&HCVs	**44,701**	**87,565**	**95.89**	**48,540**	**80,534**	**65.91**	**5,320**	**7,804**	**46.69**
LCVs									
Passenger Carrier	11,429	5,688	-50.23	10,170	4,662	-54.16	1,168	733	-37.24
Goods Carrier	99,408	141,939	42.78	88,189	125,160	41.92	7,514	11,503	53.09
Total LCVs	**110,837**	**147,627**	**33.19**	**98,359**	**129,822**	**31.99**	**8,682**	**12,236**	**40.94**
Total Commercial Vehicles (CVs)	**155,538**	**235,192**	**51.21**	**146,899**	**210,356**	**43.20**	**14,002**	**20,040**	**43.12**
Three Wheelers									
Passenger Carrier	221,569	175,511	-20.79	105,263	57,252	-45.61	110,373	119,272	8.06
Goods Carrier	25,017	31,186	24.66	24,548	28,344	15.46	1,049	2,335	122.59
Total Three Wheelers	**246,586**	**206,697**	**-16.18**	**129,811**	**85,596**	**-34.06**	**111,422**	**121,607**	**9.14**
Two Wheelers									
Scooter/ Scooterettee	1,259,683	1,499,650	19.05	1,101,805	1,376,736	24.95	83,720	82,365	-1.62
Motorcycle/Step-Throughs	2,967,427	3,971,854	33.85	2,259,423	2,820,684	24.84	748,432	1,021,570	36.49
Mopeds	151,851	176,351	16.13	141,135	155,140	9.92	2,422	1,774	-26.75
Electric Two Wheelers	457	1,349	195.19	274	1,039	279.20	0	0	-
Total Two Wheelers	**4,379,418**	**5,649,204**	**28.99**	**3,502,637**	**4,353,599**	**24.29**	**834,574**	**1,105,709**	**32.49**
Quadricycle	1,099	1,536	39.76	-12	15	-225.00	751	1,272	69.37
Grand Total of All Categories	**5,613,200**	**7,148,934**	**27.36**	**4,434,934**	**5,583,149**	**25.89**	**1,082,596**	**1,361,855**	**25.80**

*** BMW, Mercedes and Volvo Auto data is not available**

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Global Lead-Zinc Scenario

LEAD

World Refined Lead Supply & Usage 2016-2021

000 tonnes	2016	2017	2018	2019	2020	2020 Jan	2021 Jan	2020/2021 Oct	2020/2021 Nov	2020/2021 Dec	2020/2021 Jan
Mine Prodn.	4713	4588	4593	4721	4493	353	366	413.6	417.1	417.2	366.2
Metal Prodn.	11546	11897	12186	12187	11741	933	999	1027.2	1072.4	1090.8	999.4
Metal Usage	11508	12046	12232	12162	11545	933	1021	1040.2	1057.9	1079.8	1021.2

ZINC

World Refined Zinc Supply & Usage 2016-2021

000 tonnes	2016	2017	2018	2019	2020	2020 Jan	2021 Jan	2020/2021 Oct	2020/2021 Nov	2020/2021 Dec	2020/2021 Jan
Mine Prodn.	12668	12681	12820	12892	12145	1017	1042	1120.4	1117.8	1129.9	1042.1
Metal Prodn.	13560	13486	13102	13480	13641	1160	1190	1192.7	1189.6	1212.6	1190.2
Metal Usage	13665	13953	13658	13709	13105	1094	1178	1166.9	1186.0	1189.1	1178.5

(Source: ILZSG)

Global Zinc & Lead Markets in 2020

The global Zinc market was oversupplied by 11700 tonnes in January 2021 after a revised surplus of 23500 tonnes in December 2020, data from ILZSG showed. For 2020, the surplus in the market was 536,000 tonnes. In 2020 Lead supply exceeded demand by 223000 tonnes.