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■ **"Our Focus Is on Building Intelligent, Reliable and Future-Ready Fabrication Technologies"**

Mr. Arun Kumar

*Founder & Managing Director,
Technocrats Plasma Systems Ltd.*

■ **Developments in Primary Aluminium Melting Technologies**





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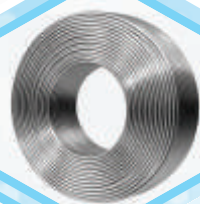
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D.A. Chandekar Editor

Aluminium is rightly being called the metal of the 21st century. If the 20th century was built on the strength of steel, the 21st century will be defined by the lightness, versatility and sustainability of aluminium. In an era driven by the twin imperatives of decarbonization and energy efficiency, no other mass-produced metal offers what aluminium does - it weighs only one-third of steel, offers high strength-to-weight ratio through its alloys, resists corrosion, conducts electricity and heat efficiently, is highly formable and, most importantly, can be recycled infinitely without any loss of quality, using only 5 percent of the energy required to produce primary metal. This unique combination makes it not just a material of choice, but a material of necessity for a greener future.

The strongest validation of this comes from the way its applications are evolving. While electrical conductors, building and construction and packaging remain its bedrock, a host of emerging applications are propelling its growth. The most transformative shift is happening in the automotive sector, where the war against weight is being led by aluminium. To meet stringent emission norms and to enhance the range of electric vehicles, automakers are aggressively replacing steel parts with aluminium and its advanced alloys in body-in-white, doors, bonnets, chassis, sub-frames, crash management systems and, most critically, in battery boxes and e-motor housings. An EV uses nearly 40 percent more aluminium than a conventional car. This lightweighting trend extends to aerospace with Al-Lithium alloys, to railways and metro coaches, to renewable energy where every solar panel

frame and many wind turbine components depend on aluminium, to green buildings that use aluminium facades for energy efficiency, and to modern power infrastructure that needs high-conductivity, lightweight transmission lines.

India is naturally positioned to be a major beneficiary of this aluminium age. The country holds one of the world's largest reserves of bauxite, the ore for aluminium, with deposits exceeding 3.8 billion tonnes located largely in Odisha, Jharkhand, Chhattisgarh and Andhra Pradesh. Backed by this resource strength, India has built an installed primary aluminium capacity of over 4.1 million tonnes and has become the second largest producer of primary aluminium globally. However, the real opportunity lies ahead. India's per capita aluminium consumption is still around 3 to 3.5 kg compared to a world average of 12 kg and over 25 kg in China. With the government's thrust on Make in India, massive expansion of power transmission, growth in affordable housing and smart cities, rapid growth in packaging, and the push for electric mobility under FAME and PLI schemes, the domestic demand is set to grow at 8 to 10 percent CAGR over the next decade.

This optimistic outlook, however, comes with a set of challenges that cannot be ignored. Primary aluminium is an energy-intensive industry, consuming about 14,500 units of power per tonne, and its green credentials depend entirely on the source of that power. Indian smelters still rely on coal-based captive power for more than 85 percent of their needs, unlike the Middle East or Canada where hydropower or gas gives a low carbon footprint. In a world moving towards Carbon Border Adjustment Mechanism and ESG-driven procurement, this becomes a major competitiveness issue. Other challenges include delays in bauxite mine auction and development, high logistics costs from mine to refinery to smelter, lack of adequate domestic technology for high-end alloys required for automotive and aerospace, and rising imports of aluminium scrap and low-value downstream products that discourage domestic value addition. The path forward therefore requires a concerted effort towards transition to renewable power, investment in downstream and high-end alloy development, creation of a robust domestic scrap recycling ecosystem, and policy support to ensure raw material security. If these challenges are addressed, India can truly transform its bauxite advantage into a global aluminium leadership.

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“Our Focus Is on Building Intelligent, Reliable and Future-Ready Fabrication Technologies”

Mr. Arun Kumar is the Founder & Managing Director of Technocrats Plasma Systems Ltd. An engineer by qualification and a former scientist at Bhabha Atomic Research Centre (BARC), he has built his career around engineering, product development and industrial technology. Known for his straightforward and inclusive leadership approach, he has played a key role in developing Technocrats' indigenous technology and expanding its portfolio of plasma, CNC cutting, welding and automation solutions.

Mr. Arun Kumar
 Founder & Managing Director,
 Technocrats Plasma Systems Ltd.

India's metallurgical and metal-processing industries are undergoing a significant technological transformation, with automation, precision and energy efficiency becoming increasingly important across fabrication and manufacturing operations. Technologies such as plasma cutting, CNC systems, robotics and advanced welding are helping manufacturers improve productivity while reducing manual intervention and overall processing costs.

At the forefront of this transition is Technocrats Plasma Systems Ltd, an Indian engineering company focused on the development of plasma cutting, CNC cutting, robotic automation, welding and thermal-processing solutions. Founded and led by Mr. Arun Kumar, a former scientist at Bhabha Atomic Research Centre (BARC), the company has built its capabilities around indigenous product development and engineering.

In this Face to Face, Mr. Arun Kumar discusses the relevance of plasma technology, Technocrats' product portfolio, the evolving Indian metallurgical industry, the company's post-IPO expansion plans and the policy measures needed to strengthen domestic technology and manufacturing capabilities.



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**CNC PLATE PROFILE CUTTING SYSTEMS
MODEL - CUB**

Q. What is plasma cutting, and how is it relevant to the metallurgical and metal-processing industries? What advantages does it offer in productivity, precision and cost?

Plasma cutting is a thermal cutting process that uses an ionised gas stream at temperatures exceeding 20,000°C to melt electrically conductive materials and remove the molten metal from the cut kerf. In metallurgical and structural fabrication, it serves as an important primary operation between raw plate stock and final fabrication or welding.

One of its major advantages is productivity. Plasma systems can deliver cutting speeds three to five times faster than traditional oxy-fuel processes on medium-thickness plates in the range of 10–50 mm. They also require no preheating before piercing, which further improves productivity.

Modern high-definition plasma systems provide high levels of precision and edge quality, with bevel angles of less than 2°, minimal dross and relatively low heat-affected zones. This can significantly reduce or eliminate secondary grinding operations before fit-up and welding.

Plasma cutting also offers cost advantages. On medium-thickness plates, its operating cost per metre can be significantly lower than oxy-fuel because of higher throughput and reduced fuel-gas consumption. At the same time, plasma systems require substantially lower capital investment than high-power fibre laser systems for thick-plate processing.

Q. What are Technocrats Plasma Systems' key products and technology offerings, and how do they address the evolving requirements of the metallurgical and metal-processing industries?

Technocrats Plasma Systems provides end-to-end mechanised cutting, welding and thermal-processing solutions designed for heavy engineering, infrastructure and metal-fabrication applications.

Our portfolio includes CNC plasma and fibre laser cutting machines, with heavy-duty, high-speed gantries integrated with automated gas consoles and bevel heads for demanding, high-duty-cycle fabrication environments. We also offer

robotic cutting and welding systems, including multi-axis robotic cells for complex structural profiles, beveling, pipe cutting and high-throughput automated welding.

Another area is our integrated air plasma systems. These compact, self-contained units incorporate integrated compressors and closed-loop cooling systems, making them suitable for applications requiring mobility, a smaller footprint and site-based operations.

In addition, we have developed high-temperature plasma gasification torches for specialised waste-to-energy and industrial waste-processing applications.

Together, these technologies address the industry's growing need for higher levels of automation, reduced dependence on manual labour, improved energy efficiency and lower total cost of ownership. Our focus is on developing practical solutions that can improve productivity while meeting the specific requirements of different manufacturing environments.



**CNC PLATE PROFILE CUTTING SYSTEMS
MODEL - CANTICUB**

Q. How do you assess the present state of India's metallurgical industry? What opportunities do you see for its growth over the next five to ten years?

India's metallurgical and metal-processing sector is undergoing a major structural transition. Strong national infrastructure programmes, increasing defence manufacturing and domestic capital expenditure are driving growth in the processing of structural steel, aluminium and heavy plates.

One of the most visible changes is the transition towards automation. Fabricators are increasingly moving away from manual oxy-fuel cutting towards CNC automated plasma, robotic cutting and high-power fibre laser systems. This shift is being driven by the need for tighter engineering tolerances,



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higher productivity and greater consistency.

Sustainability is another important growth driver. Increasing pressure to reduce carbon intensity is encouraging processing units to adopt more energy-efficient machinery and technologies such as waste-heat recovery systems.

Over the next five to ten years, we see significant opportunities across heavy infrastructure, bridges, railways, expressways, shipbuilding and renewable-energy infrastructure, including wind towers and solar mounting structures. The localisation of defence production under the Make in India initiative is another important area of opportunity.

As these sectors expand, the demand for advanced cutting, welding, automation and fabrication technologies is expected to increase correspondingly.



**CNC PLATE PROFILE CUTTING SYSTEMS
MODEL - PANTHER**

Q. Following your recent IPO, what are your expansion plans? How do you intend to utilise the new capital for capacity expansion, new technologies, product development and market growth?

Our post-IPO growth strategy is focused on scaling manufacturing capacity, strengthening internal R&D and expanding our geographical reach.

On the manufacturing side, we are developing advanced facilities with the objective of doubling our annual machine output. This will help us address existing order backlogs while also reducing delivery timelines for heavy CNC and robotic systems.

A significant portion of our focus will remain on technology and product development. We intend to invest in next-generation plasma power-source design, high-acceleration CNC motion-control systems, automated beveling technology and further development of our plasma gasification applications.

We also plan to strengthen our sales and service engineering network across key industrial corridors in India. At the same time, we see opportunities to expand our export footprint across Southeast Asia, the Middle East and Africa.

Another important priority is greater supply-chain integration. Bringing critical sub-assemblies and component



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manufacturing in-house will help us maintain tighter control over product quality while also reducing overall unit manufacturing costs.

Q. What are the key challenges facing India's metallurgical industry, and what policy measures would you like to see to support technology adoption, domestic manufacturing, innovation and global competitiveness?

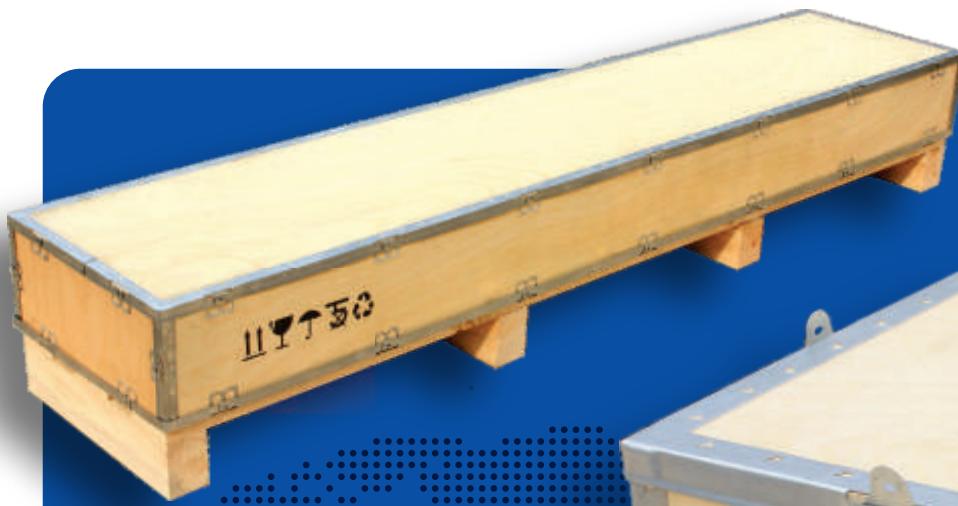
The industry continues to face several challenges, including fluctuating raw-material costs, high capital borrowing rates, shortages of skilled machine operators and competition from low-cost imported machinery.

To develop a globally competitive ecosystem, greater policy support is required for technology adoption, skill development and indigenous product development. Targeted capital subsidies and suitable production-linked incentive or technology-upgradation schemes could be extended to MSME fabricators adopting advanced CNC, robotic and energy-efficient processing systems.

Skill development is another important area. Public-private partnerships could establish specialised vocational training facilities focused on CNC programming, advanced welding and robotic automation maintenance. This would help address the shortage of skilled personnel while preparing the workforce for increasingly automated manufacturing environments.

There is also a need for appropriate quality standards for imported machinery, particularly at the lower end of the market, alongside stronger support for indigenous R&D. Tax incentives and matching grants for domestic OEMs developing core industrial technologies locally could encourage greater investment in product development and innovation.

A combination of technology adoption, skilled manpower and support for domestic engineering capabilities can help Indian manufacturers become more competitive in both domestic and international markets.



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Hindalco and Metalshub Introduce Digital Tenders for Alumina

Hindalco Industries, through its subsidiary Utkal Alumina International Limited, has partnered with Metalshub, a strategic partner of the London Metal Exchange (LME), to introduce a digital tendering mechanism for the sale of metallurgical-grade alumina. The initiative is aimed at increasing transparency, broadening market participation and strengthening price discovery in the global alumina market.

The move comes against the backdrop of a global alumina market in which spot transactions account for only a relatively small share of overall trade. Of the estimated 55–60 million tonnes of third-party alumina shipments traded globally each year, around 10% is sold through the spot market. However, these spot transactions play an important role in establishing benchmark prices that influence a much larger volume of alumina traded through long-term contracts.

Unlike aluminium, which has an established exchange-based pricing mechanism, alumina pricing relies significantly on privately published indices based on voluntarily reported transactions. Hindalco and Metalshub believe that a structured digital tendering mechanism can provide greater access to transaction data while enabling



competitive bidding among a broader group of market participants.

Under the new system, Hindalco will offer spot alumina cargoes through defined digital tender windows on the Metalshub platform. Buyers will be able to participate in secure electronic bidding, with competitive offers determining the outcome of individual tenders. The approach is intended to provide transaction-based information that can contribute to more transparent and market-driven price discovery.

Saurabh Khedekar, CEO, Alumina Business, Hindalco Industries, said that the company aims to broaden market participation and improve efficiency and transparency in the global alumina market through digital tenders.

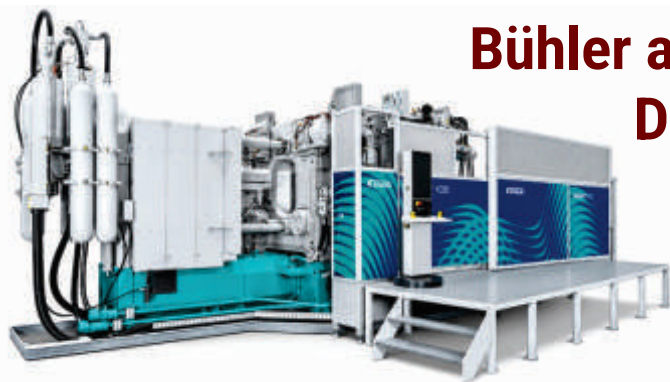
Dr. Sebastian Kreft, Managing Director, Metalshub, noted that although only a small proportion of global alumina is sold on the spot market, those transactions have an influence on pricing across the broader market. According to

him, structured digital tenders can expose individual cargoes to competitive bidding from a wider pool of buyers while generating verifiable transaction data.

Hindalco currently sells alumina through a combination of long-term contracts and spot transactions, with spot sales traditionally handled through a standard request-for-quotation (RFQ) process. The new digital tendering mechanism will replace the existing spot sales process. The Metalshub platform has also undergone information security and data governance assessments to support the transaction lifecycle.

Hindalco's first digital alumina tender is expected to take place between October and December 2026. Details including the tender date, quantity and specifications will be communicated to registered participants in advance.

The initiative could represent a significant development in the digitalisation of industrial raw-material markets. By moving spot alumina sales from conventional RFQ-based transactions to structured electronic tenders, the partnership seeks to increase competition among buyers and generate more transparent, transaction-based market information.



Böhler and Hyundai Mark 20 Years of Die-Casting Partnership

Swiss technology group Böhler and Hyundai Motor Group have completed 20 years of collaboration in die-casting technology, during which Böhler has supplied 43 die-casting

systems to Hyundai production facilities across South Korea, China and India.

The partnership began in 2006 with the installation of a Böhler Evolution 270D machine at Hyundai's Ulsan complex in South Korea. Over the following two decades, the collaboration has expanded to include both Carat and Evolution die-casting systems, supporting Hyundai's evolving requirements in automotive component manufacturing.

The automotive industry has undergone significant changes

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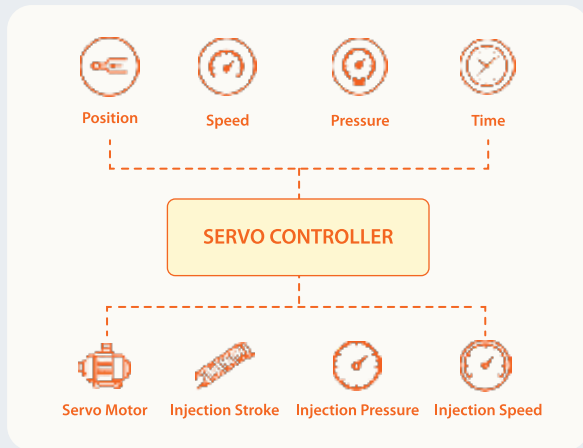
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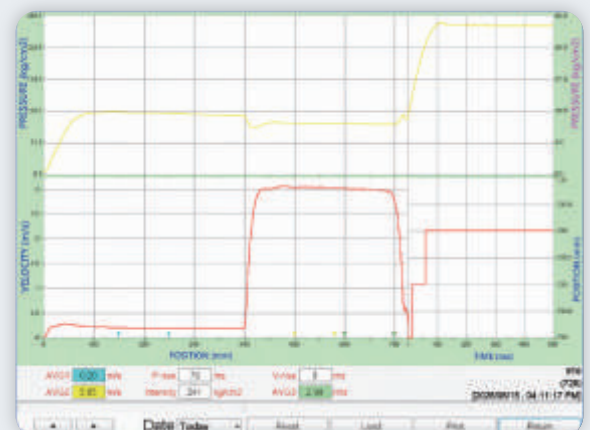
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during this period, moving beyond a primary focus on production scale and cost efficiency towards electrification, digitalisation, autonomous driving and greater manufacturing flexibility. Hyundai has correspondingly expanded its focus on electric and hybrid vehicles, regional production capabilities and flexible manufacturing systems.

Bühler's die-casting technologies have supported this transition. Of the 43 systems supplied to Hyundai, six Carat machines have been installed at Hyundai WIA's facility in Rizhao, China, while another Carat machine is operating at Hyundai Motor's research and development foundry centre in Ulsan. Hyundai WIA is an affiliate of Hyundai Motor Group specialising in automotive components.

The Carat is Bühler's high-pressure die-casting platform, with die-locking forces ranging from 10,500 to 92,000 kN. The system is designed for the

production of large and complex aluminium and magnesium structural components.

Bühler has also supplied 36 Evolution machines to Hyundai. With locking forces ranging from 2,600 to 42,000 kN, the Evolution platform is designed for automotive applications including powertrain, structural and e-mobility components.

The long-term partnership has also extended beyond equipment supply to include technical support, training, upgrades and ongoing cooperation. Notably, the first Bühler machine installed at Hyundai two decades ago remains in operation and has recently undergone a control-system upgrade.

According to Bühler, Hyundai has reported improvements on production lines equipped with its technology, including up to 50% reduction in scrap rates and around 10% improvement in overall equipment effectiveness (OEE).

These improvements have contributed to more efficient material utilisation and production performance.

The collaboration is also evolving in line with Hyundai's longer-term manufacturing objectives. Hyundai is targeting global vehicle sales of 5.55 million units by 2030, with electrified vehicles, software-defined vehicles, autonomous driving, next-generation battery technologies and smart manufacturing forming key elements of its strategy.

For Bühler, the partnership represents a long-term technology relationship spanning conventional automotive components as well as emerging applications associated with electrification and e-mobility. The 20-year collaboration demonstrates the growing importance of advanced die-casting technology in improving productivity, material efficiency and manufacturing flexibility across the automotive sector. ■

Hindustan Zinc Deploys 30 Electric Trucks for Mine-to-Smelter Logistics



Hindustan Zinc Limited has signed a six-year transportation contract with MFL India Limited for the deployment of 30 electric trucks for transporting zinc and lead concentrates, marking another step in the company's efforts to electrify its mine-to-smelter logistics network. The contract includes an option for a further two-year extension.

The electric trucks will be progressively deployed to replace conventional diesel vehicles transporting concentrates from Rampura Agucha Mine in Rajasthan to Hindustan Zinc's

smelting facilities. MFL India will establish and operate dedicated charging infrastructure to support the fleet and ensure reliable electric transportation along the route.

The initiative forms part of Hindustan Zinc's wider adoption of cleaner mobility across its mining and metals operations. The company has been expanding the use of electric and LNG vehicles while continuing to involve local drivers in its transportation network.

Amarendu Prakash, CEO & Whole-time Director, Hindustan Zinc, said that responsible and efficient transportation is becoming an important part of sustainable mining, adding that the deployment of electric trucks represents a step towards industrial decarbonisation.

The latest agreement builds on the company's expanding green logistics fleet. During FY2026, Hindustan Zinc added 42 electric vehicles for material transportation, taking its overall green logistics fleet to 232 vehicles, comprising 52 EVs and 180 LNG vehicles.

Hindustan Zinc has also deployed battery-electric vehicles in underground mining at its Sindesar Khurd Mine in Rajpura Dariba, Rajasthan, and is extending electrification across other areas of its operations and supply chain.

The initiative is aligned with the company's decarbonisation roadmap, which targets Net Zero emissions by 2050 or sooner. Renewable energy currently accounts for nearly 22% of its power mix, alongside ongoing efforts in renewable power, electrification and energy efficiency. ■

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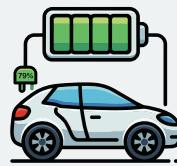
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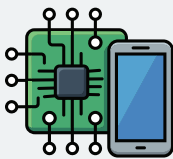
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Developments in Primary Aluminium Melting Technologies



Dhirajlal K. Chauhan

D.K. Chauhan is a Metallurgical Engineer with B.Tech (Hons) and M.Tech degrees in Metallurgical Engg. from IIT Bombay with over 30 years industrial experience. He offers consultancy services in Heat Treatment field of Alloy steels and Quality assurance, process controls in the areas of Cold rolling of D, DD, EDD, IF steels, Medium / High carbon steels.

Primary aluminium melting and smelting technology is shifting toward zero-carbon emissions, advanced digitalization, and next-generation reduction cells. Energy and greenhouse gas emission remain the major technological challenges to the aluminium production. Over the last few decades, aluminium industries have been aiming for higher production volumes through capacity creep in the existing smelters with reasonable additional investment. However, a strong focus on specific energy consumption has always been part of technology considerations, and this aspect is even more critical today from the point of view of long-term sustainability. Through research and innovations in design, control and operations of Hall-Héroult cell,

modern smelters are achieving a benchmark performance as low as 13 kWh/kg of Al at commercial scale and 12 kWh/kg of Al at pilot scale. There is also significant research effort put on alternate technology platforms like drained cathode cell and inert anode. Although there are many pilot-scale demonstrations, many critical issues like operating cost and stability problems in drained cell and higher specific energy in inert anode need to be addressed for commercial consideration of these technologies. Industry 4.0 platform technologies like internet of things, cloud computing, machine learning and artificial intelligence, etc., are opening up further opportunities for benchmark performance to the modern smelters. Digital twin is such an emerging technology for predictive control and operation and will be a key driver for low-energy cells. Based on a discussion on the status of present technology, this article presents a comprehensive review of the technological progress of aluminium smelting and emerging new technology like Industry 4.0, towards reduction of energy and making aluminium production sustainable.

Over the past quarter of a century there have been technological and structural developments, including:

- 1) The structure of the competing companies;
- 2) The dominant geographic areas;
- 3) The size and current intensity of plotlines;
- 4) Digitalization and Robotisation;
- 5) Recycling of spent pot lining,
- 6) Improved energy efficiency;



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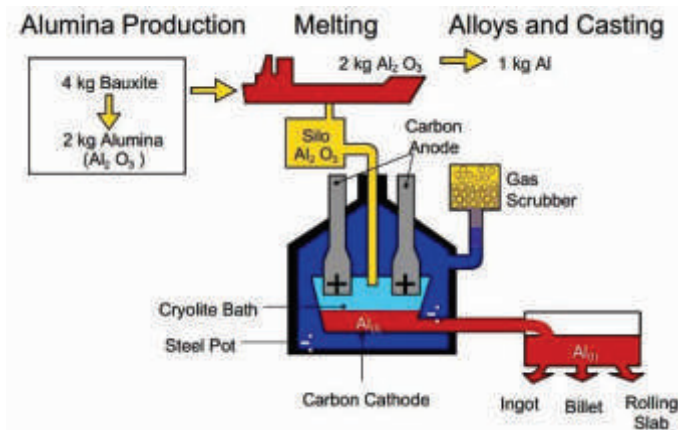


Figure 1: Aluminium smelting from Bauxite

- 7) New, renewable energy sources;
- 8) Flexible energy use to stabilise local electricity grids;
- 9) The development of inert anodes;
- 10) New grades of metal with lower CO₂ footprints;
- 11) ASI standards (for management, environment and social responsibility).

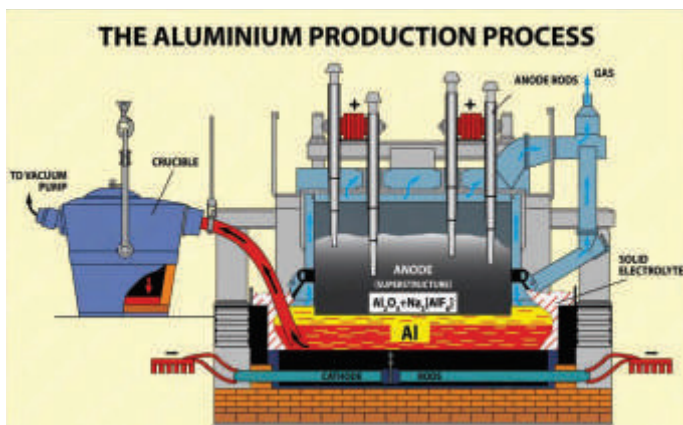


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Figure 2: Aluminium production process

Roadmap to net-zero:

The aluminium industry's main challenge lies in the carbon intensive nature of the industrial processes that form the foundation of modern aluminium production. The widespread use of fossil fuels to power the smelting process is the main reason why the aluminium industry today accounts for two percent of global CO₂e emissions. In addition, the electrolysis process itself emits CO₂ when aluminium oxide and carbon react under a strong electric current to produce primary aluminium.

At the same time, aluminium has unique properties that make it an important enabler for the green transition, with demand for the light, versatile and infinitely recyclable

metal expected to grow in line with the need to mitigate climate change. This is the paradox the aluminium industry needs to address. We must rethink how we make aluminium or even challenge the basic principles of aluminium production before the metal can fully step into the role as a more sustainable material for the future.

Revolutionary technology eliminates virtually all direct greenhouse gas emissions from the production of new aluminum. Instead of CO₂, the newly devised "inert anode" system emits oxygen during the smelting process.

Revolutionary technology eliminates virtually all direct greenhouse gas emissions from the production of new aluminum. Instead of CO₂, the newly devised "inert anode" system emits oxygen during the smelting process. (The electric energy that runs through an anode is what enables aluminum smelting). This game-changing innovation has the potential to make aluminum – already one of the most sustainable materials on the market today – even greener.

Already, primary aluminum production in North America is cleaner today than it has ever been. Since 1991, the carbon impact of primary aluminum production in the U.S. and Canada has declined by nearly half thanks to voluntary efforts by the industry to reduce emissions, technology control improvements and increased regional reliance on renewable hydropower as an energy source.

Energy and greenhouse gas emission remain the major technological challenges to the aluminium production.

Over the last few decades, aluminium industries have been aiming for higher production volumes through capacity creep in the existing smelters with reasonable additional investment. However, a strong focus on specific energy consumption has always been part of technology considerations, and this aspect is even more critical today from the point of view of long-term sustainability. Through research and innovations in design, control and operations of Hall-Héroult cell, modern smelters are achieving a benchmark performance as low as 13 kWh/kg of Al at commercial scale and 12 kWh/kg of Al at pilot scale.

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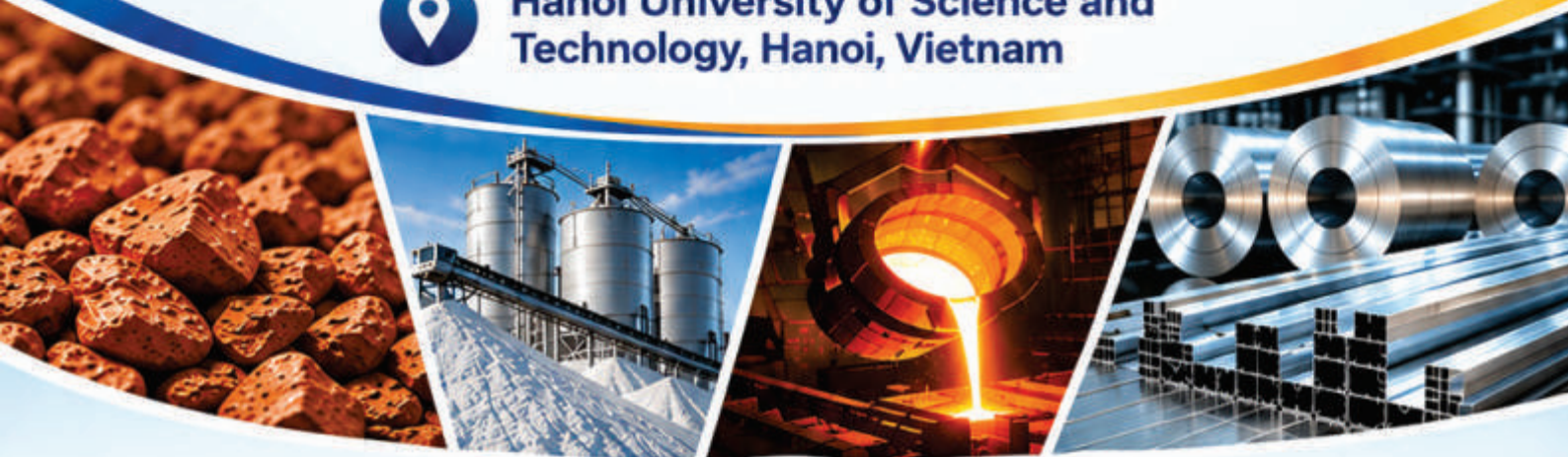
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energy in inert anode need to be addressed for commercial consideration of these technologies. Industry 4.0 platform technologies like internet of things, cloud computing, machine learning and artificial intelligence, etc., are opening up further opportunities for benchmark performance to the modern smelters. Digital twin is such an emerging technology for predictive control and operation and will be a key driver for low-energy cells. Based on a discussion on the status of present technology, this article presents a comprehensive review of the technological progress of aluminium smelting and emerging new technology like Industry 4.0, towards reduction of energy and making aluminium production sustainable.

Inert anodes

Elysis is beginning construction of pilot cells at 450 kA in 2024 and, for 2027, plans 2,500 tpy production from a demonstration line of ten cells at 100 kA. However, as dissolution from the inert anodes limits the purity of the aluminium produced, they would never completely replace carbon anodes for all grades of metal.

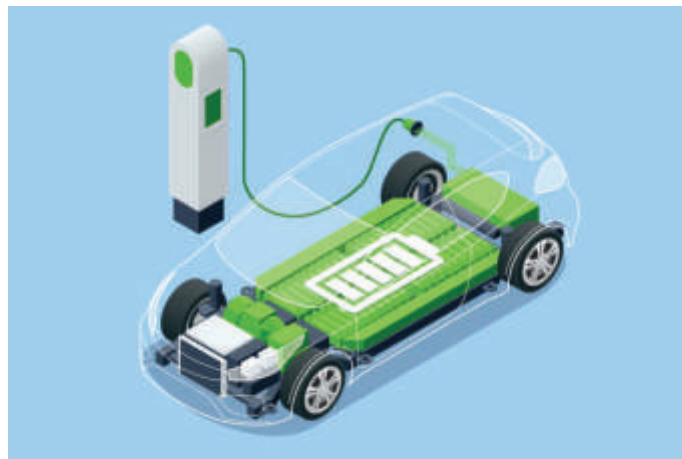
Digitalisation

Algorithms will enable autonomous decision-making for each cell in electrolytic production, significantly improving the operational stability, efficiency and lifespan of electrolytic cells, and thereby addressing key industry challenges.

For this digitalisation, the primary aluminium industry has developed direct and accurate bath chemistry measurement in reduction cells to optimise bath composition, to determine online bath temperature, liquidus temperature and superheat. Also, continuous measurement of the voltage drop across the cathode in electrolysis seems possible, as this is a known control procedure to measure the state of graphite cathode blocks to give an indication for the potlife.

Robotisation

Due to climate change and for safety reasons, diesel-fuelled floor vehicles are more and more being replaced with battery-driven vehicles, especially vehicles to transport sealed anodes to the potroom and to take back anode butts, as well as transport vehicles for tapped



metal, which bring the liquid metal from the potroom to the casthouse. These vehicles are remotely guided, or move completely computer controlled.

Solved problems

Red mud can now be turned into fertile soil.

Spent potlining (SPL) is no more a material for hazardous landfills, but is used as primary ingredient in the cement and steel industries, although much SPL remains in old landfills.

The pot sidelining problem is solved by using nitride-bonded silicon carbide and computer-controlled bath ledge formation.

Major improvements

Copper sealed steel cathode bars are used to minimise the cathode voltage drop.

Thanks to the availability of 2500 DCV rectifiers, more than 450 pots can now be found in one potroom.

Questions for the future

- Will the 1000 kA cell one day be realised?
- Will the aluminium chloride electrolysis process, proposed by Hydro, one day see the industrial scale for primary aluminium production?
- Will the inert anode, which Elysis promises on a semi-industrial scale for 2027, see the industrial scale one day? (If one day the inert anode becomes widely available, it will not totally replace the prebake anode for higher purity aluminium.)
- Will the wettable cathode one day be available for the primary aluminium industry?
- How soon will more aluminium be recycled per year than primary aluminium produced?

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IBAAS 2026 Conference & Exhibition: Advancing Sustainable and Smart Aluminium



The 14th International Bauxite, Alumina & Aluminium Conference & Exhibition (IBAAS-2026) was successfully held from 9–11 September 2026 at MAYFAIR Hotels & Resorts, Jharsuguda, Odisha, India. The three-day event brought together 325 delegates from more than 100 companies and organizations, representing bauxite, alumina and aluminium producers, technology and equipment suppliers, R&D institutions, academia and service providers. International participation included delegates from India, China, Turkey, Spain, Malaysia, Australia, Canada, France, Germany, Japan, Italy, the Netherlands, Sweden, the UAE, the UK and the USA.

The central theme, “Global Aluminium Outlook 2030: Secure Resources, Efficient Energy and Value from Wastes,” reflected the industry's priorities for sustainable resource utilization, energy efficiency, waste valorisation and circularity. The conference also highlighted the growing importance of digitalisation, artificial intelligence, green aluminium, recycling, resource efficiency and technological

innovation in shaping the aluminium industry towards 2030.

Key Technical Focus Areas

The technical programme addressed several critical areas across the aluminium value chain, including:

- Digitalisation, Artificial Intelligence and Green Aluminium, with emphasis on process optimisation, predictive maintenance, data analytics, intelligent quality control and data-driven decision-making.
- Bauxite Beneficiation and Non-Metallurgical Bauxite–Alumina, focusing on beneficiation, efficient resource utilisation and value addition.
- Bauxite Residue (Red Mud), covering sustainable management, utilisation and recovery of valuable resources.
- Cathodes, Energy Management and Pot-Life Extension, addressing improved cathode technologies, energy efficiency and cell performance.
- Value Recovery from Aluminium and Power Plant Wastes, promoting sustainable utilisation and resource recovery.

- Aluminium Alloys and Smart Engineering Solutions, focusing on advanced alloys and sustainable applications.
- Aluminium Recycling, highlighting scrap utilization, circular economy practices and the transition towards green metal.

Inauguration and Keynote Addresses

The inaugural function was graced by Mr. Rajesh Kumar, CEO, Vedanta Aluminium, as Chief Guest, along with distinguished industry experts including Mr. Bibhu Mishra, Advisor, Hindalco; Mr. Takuo Harato, Leading Alumina Expert, Japan; and Mr. Senthil Nath, President–MCOE, Hindalco Industries Ltd. Dr. Arun Nandi, Secretary, IBAAS, welcomed the delegates, followed by the Conference Convener's address. The IBAAS souvenir and IBAAS BINDER Volume XIV, containing technical papers, were released during the ceremony, followed by the opening of the exhibition.

Seven keynote addresses covered major industry challenges and opportunities, including structural transformation in aluminium, sustainability of the alumina industry, global cooperation, resource depletion and geopolitical volatility, aluminium applications and ESG, critical mineral recovery from bauxite residue, and the status of the bauxite, alumina and aluminium industry in Vietnam.

Technical Programme

The second day featured three parallel technical sessions. The Auditorium focused on Digitalization and AI Applications in Aluminium Industry, covering AI, machine



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learning, data analytics, automation, predictive maintenance and process optimization. Hall-1 addressed Special Bauxite–Alumina, including beneficiation, processing, applications and value addition, while Hall-2 focused on Aluminium Smelting, including reduction technology, energy efficiency, cell performance, anode technology, process control and operational optimization.

The technical programme continued on the third day with sessions on Green Aluminium, Aluminium Downstream and Alloys, and Aluminium Recycling, highlighting sustainable production, downstream processing, alloy development, recycling, resource recovery and circularity.

Among the technical presentations recognized through the IBAAS Best Paper Presenter Awards were contributions on AI-guided optimization of precipitation processes, integrated data analytics for fume treatment plants, bauxite residue utilization, aluminium trihydrate applications, anode quality improvement, pre-baked anode quality, AA6201 alloy age-hardening, and compressor-house reliability through online vibration monitoring.

Exhibition and Industry Participation

The exhibition was a major attraction of IBAAS 2026, featuring 10 domestic and international companies displaying technologies, equipment, products, services and innovative solutions for the aluminium industry. It provided delegates with opportunities to explore emerging technologies, exchange technical knowledge and establish business connections. IBAAS also acknowledged the valuable support of its sponsors, exhibitors, partners and media partners.



ESG Awards 2026

The IBAAS-CETIZION ESG Awards 2026 recognized companies demonstrating strong Environmental, Social and Governance performance and responsible business practices. The award recipients included:

- Hindalco Industries Ltd., Hirakud Power – Gold
- Midal Cables – Platinum
- Hindalco Industries Ltd., Kuppam – Gold
- Cevher Jant Sanayii A.Ş. – Platinum
- Hindalco Industries Ltd., Mahan – Gold
- Hindalco Industries Ltd., Hirakud FRP – Silver
- GZ Industries Ltd. – Gold

The ESG panel discussion further highlighted industry initiatives and best practices aimed at improving environmental performance and sustainable development across the aluminium value chain.

Post-Conference Visit and Conclusion

A post-conference industrial visit was organized on 12th September 2026 to

Aditya Aluminium, Hindalco Industries Limited, Lapanga. Selected delegates had the opportunity to observe large-scale aluminium smelting operations, plant processes and industrial practices, providing practical exposure to technologies and operational approaches while strengthening industry–academia interaction and professional networking.

The IBAAS 2026 Conference & Exhibition successfully provided a platform for technical dialogue, knowledge sharing, innovation and collaboration across the global bauxite, alumina and aluminium industry. With strong emphasis on digitalization, artificial intelligence, green aluminium, resource efficiency, waste valorization and sustainable practices, the event brought together industry leaders, researchers, technology providers and academia to discuss emerging technologies, operational challenges and future opportunities. The conference reinforced the importance of collaboration and innovation in building a smarter, more efficient, sustainable and competitive aluminium industry.

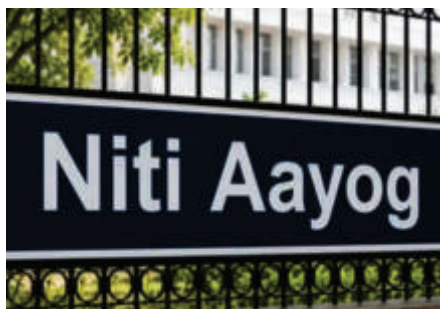
NITI Aayog Calls for Reforms in Metals and Minerals Sector

NITI Aayog has recommended a series of measures aimed at improving the competitiveness of India's metals and minerals sector, with greater emphasis on mineral exploration, regulatory reforms, renewable energy access and preparation for evolving international trade requirements.

The recommendations were included in the think tank's Trade Watch Quarterly report, which examined India's metals and ores sector and its exposure to international markets.

One of the key areas highlighted is mineral exploration. Expanding exploration activity and improving the discovery and development of domestic mineral resources could strengthen raw-material availability for India's growing metals industry.

The report also highlighted the importance of preparing Indian producers for changing international environmental and trade requirements, including the European Union's Carbon Border Adjustment Mechanism (CBAM). Carbon-intensive sectors such as steel and aluminium are particularly



exposed to the transition towards carbon-linked trade measures.

NITI Aayog has recommended improving access to renewable energy for industrial users. It has also called for greater uniformity in renewable-energy open-access regulations, improved renewable-energy banking provisions and rationalisation of wheeling and cross-subsidy charges for group-captive projects.

These measures are particularly relevant for energy-intensive metallurgical operations. Aluminium smelting, steelmaking, ferroalloy production and several refining processes require substantial quantities of electricity, making energy availability and cost important factors

in international competitiveness.

The report noted that India's trade exposure to the European Union varies across metals. The EU accounts for around 39.3% of India's iron and steel export exposure, while its share for aluminium is approximately 15.6%.

For Indian producers, the changing trade environment means that competitiveness will increasingly depend on both production economics and environmental performance. Access to lower-carbon electricity, improved energy efficiency and better emissions measurement could therefore become important elements of export strategy.

The recommendations come at a time when Indian metals companies are investing in capacity expansion while also responding to international requirements around carbon intensity and supply-chain sustainability.

Greater integration between mineral exploration, industrial policy, renewable energy and trade preparedness could influence the development of India's metals industry over the coming years.

Hindalco Reports Record Aluminium Upstream Performance

Hindalco Industries reported a record performance from its India aluminium upstream business in the first quarter of FY2026-27, supported by stronger aluminium prices, improved operating performance and favourable market conditions. The results, announced in August, underline the strong earnings environment for India's primary aluminium producers.

Hindalco's aluminium upstream revenue rose 44% year-on-year to ₹13,403 crore during the quarter ended June 30, 2026. Business segment EBITDA reached a record ₹7,390 crore, an 81% increase over the corresponding quarter of the previous year. EBITDA per tonne increased 59% to \$2,331, while the upstream business maintained an EBITDA margin of around 55%.

Aluminium upstream shipments also increased, reaching 335,000 tonnes compared with 325,000 tonnes in Q1 FY26. The performance reflects the combined impact of higher metal realisations and continued operational improvements across Hindalco's integrated aluminium operations.

The company is simultaneously expanding its primary aluminium capacity in Odisha. The second phase of its Aditya

aluminium smelter remains on track to begin metal production in FY2028. The expansion forms part of Hindalco's broader investment programme in the state, which includes additional downstream aluminium manufacturing capabilities.

The strong first-quarter results come at a time when global aluminium markets are experiencing supply-side constraints and elevated prices. For Indian primary producers, the combination of favourable international pricing and growing domestic demand is supporting earnings visibility while improving the economics of capacity expansion.

With aluminium demand expected to remain strong across transportation, electrical applications, renewable energy, packaging and construction, producers are increasingly balancing volume growth with investments in downstream value addition. Hindalco's performance therefore provides an indication of the current operating environment for India's integrated aluminium producers, where resource security, smelting efficiency and premiumisation are becoming increasingly important to long-term competitiveness.

Technology Adoption Emerges as Key Priority for Metals Industry



India's mining and metals industry is facing increasing pressure to improve technology adoption, resource efficiency and supply-chain resilience as operating costs rise and ore grades decline.

A recent FICCI-KPMG assessment has highlighted technology transformation as an increasingly important requirement for the sector. The report points to several challenges facing Indian mining and metals companies, including higher input costs, declining ore grades, geopolitical risks, decarbonisation requirements and changing customer expectations.

The assessment argues that competitiveness will increasingly depend not only on production volumes but also on how efficiently companies extract, process and utilise resources.

Technologies capable of improving recovery rates, reducing energy consumption and increasing operational visibility are therefore gaining importance across mining and metallurgical operations.

Digital technologies are becoming relevant across the entire value chain. Mining companies can use data analytics, automation and remote monitoring to improve exploration, equipment utilisation and mine planning, while metal producers are applying digital tools to process control, predictive maintenance, energy management and quality monitoring.

The sector is also looking at technology to make greater use of lower-grade ores, residues and secondary raw materials. Better processing and separation technologies can potentially improve resource utilisation while supporting circularity and reducing pressure on primary resources.

The technology push is also extending to metallurgical processing. Automation and advanced process-control systems can help plants

maintain operating parameters more consistently, while artificial intelligence and data analytics can assist in identifying process deviations and optimising production.

According to the FICCI-KPMG assessment, India's metals sector will need to move beyond isolated technology pilots towards systems that can be deployed and scaled across industrial operations. Collaboration between producers, technology companies, start-ups, research institutions and equipment suppliers will therefore become increasingly important.

The report also identifies the need for technology solutions suited to Indian operating conditions, including brownfield facilities, varying ore characteristics, infrastructure limitations and cost-sensitive operations.

The emphasis on technology comes as Indian metal producers seek to improve productivity while simultaneously addressing sustainability, energy efficiency and supply-chain resilience.

NALCO Advances Major Aluminium Expansion Plans

National Aluminium Company Limited (NALCO) is accelerating its expansion programme as India prepares for continued growth in aluminium demand. The state-owned producer is progressing with investments covering alumina refining, aluminium smelting, captive power and mineral resources, with the overall expansion programme estimated at around ₹30,000 crore.

A major component is the proposed 0.5 million-tonne-per-annum brownfield expansion of NALCO's aluminium smelter at Anugul, Odisha. The project is expected to add substantial primary aluminium capacity and is targeted for commissioning by 2030. The company is also developing a 1,080 MW captive



power plant to support its expanded operations.

The expansion programme comes as NALCO strengthens its upstream integration. The company's Damanjodi alumina refinery is undergoing expansion, while development of the Pottangi bauxite mines and additional captive coal resources forms part of the broader strategy to secure raw

materials and energy for future production.

NALCO's financial performance has also provided a strong foundation for the investment programme. During FY2025-26, the company achieved record revenue from operations, profit before tax and profit after tax, alongside its highest-ever sales of alumina and aluminium metal.

The company's first-quarter FY2026-27 results, announced in July, further strengthened the outlook, with net profit rising sharply year-on-year. NALCO has indicated that the domestic demand outlook for aluminium remains favourable, supporting its plans for capacity expansion.

The company is also exploring opportunities beyond conventional primary production, including critical minerals, industrial residue utilisation, waste-to-wealth initiatives and renewable energy. These areas are expected to complement its core mining, refining and smelting operations.

NALCO's expansion plans reflect the broader growth trajectory of India's aluminium industry. With aluminium consumption expected to rise across infrastructure, electrical equipment, transportation, renewable energy and manufacturing, additional domestic smelting and refining capacity could help strengthen the

country's integrated aluminium supply chain.

The proposed investments will also reinforce Odisha's position as one of India's principal aluminium-producing regions, linking bauxite mining, alumina refining, primary metal production and captive power within an integrated industrial ecosystem.

Baphlimali Mine Gains Sustainability Certification

Hindalco's Baphlimali bauxite mine in Odisha has become the first bauxite mine in India to receive Aluminium Stewardship Initiative (ASI) Performance Standard V3.1 certification, marking a significant development in the responsible sourcing of raw materials for primary aluminium production.



Located in Rayagada district, the Baphlimali mine has an annual production capacity of 8.5 million tonnes of bauxite. The operation supplies raw material to Hindalco's Utkal Alumina refinery and therefore forms an important link in the company's integrated chain from mining and alumina production to aluminium metal.

The certification covers activities including mine planning, bauxite extraction, onsite crushing and conveyor transportation. ASI's Performance Standard evaluates environmental, social and governance performance across the aluminium value chain, including areas such as biodiversity, greenhouse gas emissions, community engagement, occupational health and safety and responsible business practices.

Baphlimali's certification brings the number of Hindalco operations holding ASI certification to 11, spanning mining, smelting and downstream manufacturing. The company has been progressively extending certification across its aluminium value chain as customers increasingly seek

greater transparency regarding the origin and production practices associated with primary aluminium.

The development is particularly relevant as aluminium producers worldwide face growing pressure to demonstrate responsible sourcing of bauxite and lower the environmental footprint of the

metal. Certification schemes such as ASI provide a framework for independent assessment of production practices and supply-chain performance.

For India's primary aluminium industry, responsible mining is becoming an increasingly important component of competitiveness in international markets. Aluminium produced from certified and traceable raw materials can help producers respond to customers seeking stronger environmental and supply-chain credentials.

The Baphlimali certification also demonstrates the importance of integrating sustainability considerations at the beginning of the aluminium production chain rather than focusing only on smelting and downstream manufacturing.

As Indian aluminium producers expand production capacity and seek greater participation in global markets, responsible bauxite mining and transparent raw-material supply chains are expected to become increasingly significant elements of the industry's long-term strategy.



Critical Minerals and Advanced Processing Gain Industry Focus

India's minerals and metals sector is placing greater emphasis on critical minerals, advanced processing and technology development as industries seek to build more resilient domestic material supply chains.

Discussions at the India-Russia Business Dialogue held in New Delhi in September highlighted opportunities for cooperation in areas including rare earths, lithium, titanium, nickel and other strategic materials. Industry and

government representatives also discussed mining, beneficiation, processing technologies and advanced metallurgical processes.

The growing focus on critical minerals reflects their increasing importance in sectors such as electric mobility, renewable energy, electronics, advanced manufacturing and defence-related applications. While mineral resources are important, developing domestic processing and refining capabilities is equally significant because much of the value associated with these materials is created after extraction.

Government representatives have emphasised the importance of developing the entire critical-mineral lifecycle, extending from exploration and mining through processing and downstream utilisation.

India is also examining

unconventional sources of critical minerals. These include mine overburden, tailings, historical dumps and waste streams such as electronic-product black mass. Recovering valuable materials from such sources could complement conventional mining and create additional feedstock for domestic processing.

For the metallurgical industry, this creates opportunities for the development of new separation, purification and refining technologies. Processing low-grade resources and secondary feedstocks can require specialised metallurgical techniques, including hydrometallurgy, pyrometallurgy, solvent extraction and advanced separation processes.

The discussions also highlighted the potential for international technology partnerships. Collaboration

in mining beneficiation, advanced metallurgical processing, automation and specialty-material production could help Indian companies develop capabilities across the critical-minerals value chain.

The broader objective is to move beyond dependence on raw-material availability towards greater domestic capability in processing and value addition. This could create opportunities for equipment manufacturers, technology providers, research institutions and downstream material producers alongside traditional mining and metal companies.

As demand for materials associated with electrification and advanced manufacturing grows, critical minerals are expected to become an increasingly important part of India's wider metallurgical landscape.

Specialty Alumina Production Expands in India

India's aluminium value chain is moving beyond conventional alumina and primary metal production, with new investments targeting specialty alumina products for advanced industrial applications. Hindalco Industries has commissioned India's first greenfield plant for Superfine Precipitated Aluminium Trihydrate (PPT ATH) at Belagavi, Karnataka, strengthening domestic production of a specialised aluminium-based material.

The new facility has an annual capacity of 30,000 tonnes and produces PPT ATH for applications including halogen-free flame-retardant cables, polymer insulators, thermal insulation, composites and paints. The plant can subsequently be expanded to 60,000 tonnes per year as demand develops.

PPT ATH is increasingly relevant to India's electrical and infrastructure sectors as manufacturers seek materials that provide fire protection while meeting evolving safety and environmental requirements. In cable applications, the material helps suppress flame propagation and smoke generation without releasing halogen acid gases.

The commissioning represents a shift toward greater value addition within India's aluminium and alumina ecosystem. Rather than limiting production to commodity-grade alumina and primary aluminium, producers are



increasingly developing specialised materials capable of serving technically demanding applications.

Hindalco has developed the technology and R&D for the new product internally. The plant incorporates automated controls and an integrated manufacturing system

designed to maintain consistent feedstock quality and product specifications.

Sustainability is another feature of the facility. According to Hindalco, the plant operates entirely on renewable energy generated through biomass, solar and wind sources. The company's Belagavi refinery, which supplies the facility, recorded a greenhouse-gas intensity of 0.44 tCO₂e per tonne of alumina on a year-to-date FY26 basis.

The development reflects a wider trend within India's aluminium industry toward specialty materials and downstream value addition. Growing demand from electrical infrastructure, electric mobility, construction and advanced manufacturing is encouraging producers to diversify their product portfolios.

For the primary aluminium sector, such investments provide an additional route to capture value from an integrated raw-material base while supporting domestic manufacturing of specialised materials that have traditionally depended on imports.

Saudi Arabia Targets Strong Growth in Aluminium Demand



Saudi Arabia's aluminium consumption is expected to increase substantially over the coming years as infrastructure development, construction activity and industrial investment accelerate across the Kingdom.

According to Saudi mining and metals producer Ma'aden, aluminium demand in the country could double within five to seven years. The projected increase is linked to major investments in infrastructure, manufacturing and construction, alongside the development of large-scale projects associated with the country's economic diversification programme.

The growth in domestic demand is significant for the regional aluminium industry because Saudi Arabia has an established primary aluminium production base and a growing downstream manufacturing sector.

Aluminium is increasingly being used in construction, transportation, packaging, electrical applications and industrial manufacturing. Its combination of low density, corrosion resistance and recyclability makes it particularly suitable for infrastructure and lightweighting applications.

The expected demand increase could therefore support

further development of downstream aluminium processing capacity in Saudi Arabia. This includes extrusion, rolling, fabrication and production of specialised aluminium products.

The country's construction and infrastructure pipeline is also expected to remain an important demand driver. Aluminium is widely used in façades, windows, doors, roofing systems and other architectural applications. Industrial and transportation projects provide additional markets for extrusions and fabricated products.

Saudi Arabia is also developing its position as a regional metals and mining hub. Increasing domestic aluminium consumption could strengthen the integration between primary metal production and downstream manufacturing while reducing the need to import certain finished aluminium products.

The wider Gulf region has experienced considerable disruption to aluminium supply chains during 2026, highlighting the importance of developing resilient regional production and distribution networks.

For primary aluminium producers, stronger Saudi demand could provide an expanding nearby market for metal produced within the Gulf. For downstream manufacturers, increasing consumption could encourage investment in conversion capacity and higher-value aluminium products.

The projected growth also illustrates the changing geography of aluminium demand. While established markets in Europe and North America remain important, infrastructure development and industrialisation in the Middle East are creating new sources of consumption for primary aluminium and downstream products.

Indonesia's Copper Smelters Resume Production

Indonesia's refined copper supply outlook has improved following the restart of two major copper smelters operated by Freeport Indonesia, easing some of the tightness that had affected the international refined copper market.

PT Smelting, which has annual copper cathode production capacity of approximately 342,000 tonnes, returned to normal operations after a roughly two-week shutdown for furnace repairs in August. Freeport Indonesia's newer Manyar smelter also



resumed concentrate feeding in August and is expected to produce copper cathode during September.

Freeport Indonesia expects combined cathode production from the two facilities to approach 400,000 tonnes during 2026.

The restart is significant because the international copper market has experienced tight refined supply conditions amid strong demand and constraints across parts of the mining and smelting chain.

Copper is an important industrial metal used extensively in electrical equipment, power

infrastructure, renewable energy systems, electric vehicles and data centres. Growth in these applications has increased the importance of reliable refined copper supply.

Market indicators reflected the change following the Indonesian smelter restarts. According to Shanghai Metals Market, the LME cash-to-three-month copper spread moved from a backwardation of more than \$500 per tonne in mid-August to a contango of approximately \$86 per tonne by mid-September. The movement indicated a significant

easing in immediate spot-market tightness.

The development also highlights Indonesia's expanding role in the global copper processing industry. The country has been investing heavily in domestic mineral processing and refining capacity rather than exporting copper concentrates without further processing.

For copper consumers, additional Indonesian cathode production can provide greater availability of refined material. For the wider industry, however, the underlying balance

between mine production, smelter capacity and refined consumption remains important.

The restart of the two facilities demonstrates how operational developments at individual large-scale smelters can influence regional physical availability and international market indicators.

With copper demand continuing to be supported by electrification and infrastructure investment, developments in major producing and refining countries will remain closely watched by fabricators, traders and end users.

Global Aluminium Market Remains Tight Amid Supply Disruptions

The global aluminium market continues to operate against a backdrop of supply uncertainty, with disruptions in the Middle East and lower exchange inventories influencing physical markets and regional premiums.

The aluminium industry has faced significant supply-chain challenges during 2026, particularly following disruptions affecting major Gulf producers. The region is an important source of primary aluminium for Europe and other international markets, making transportation and production interruptions particularly significant for consumers outside the region.

Fastmarkets reported in September that the European aluminium market continues to reflect the effects of earlier disruptions. The European duty-paid P1020 aluminium premium had reached its highest level since 2022



earlier in the year, while billet premiums also increased sharply. Although premiums have subsequently moderated, they remain an important indicator of tight physical availability.

By September 8, the aluminium P1020A premium in Rotterdam was assessed at \$490–520 per tonne, compared with a 2026 high of \$575–600 per tonne recorded in April. The decline indicates some easing of immediate supply pressure, but market participants continue to

monitor regional inventories and supply flows closely.

Exchange stocks have also remained an important factor. Aluminium inventories in LME warehouses fell significantly during the first half of the year, while Asian warehouse stocks have also reflected changes in import flows.

At the same time, producers in the Gulf are working to restore production and logistics operations. Bahrain's Aluminium Bahrain (Alba), one of the world's major aluminium smelters, has been operating at around 1.3 million tonnes annualised production while managing higher alumina logistics costs and adjusting export routes.

The market is therefore moving between two competing forces: improving production prospects in some regions and continued supply-chain risks elsewhere.



Nickel Smelters Welcome Indonesia's Revised Ore Pricing Formula

Indonesia's nickel-processing industry has welcomed a revised government pricing formula for low-grade nickel ore, with smelters saying the change could improve operating economics for high-pressure acid leach (HPAL) facilities and support greater utilisation of domestic resources.

The Indonesian Energy Ministry introduced the revised formula effective September 15, 2026, reducing the corrective factor used to calculate the price of 1.2% nickel-content low-grade ore, or limonite, from 26% to 14%. The adjustment also reduced the factor applied to cobalt contained in the ore from 30% to 17%.

Limonite is an important feedstock for HPAL plants, which produce mixed hydroxide precipitate and other intermediate materials used in the manufacture of nickel and cobalt products for the electric-vehicle battery industry. Indonesia has invested heavily in HPAL and other nickel-processing facilities as it seeks to develop greater domestic value

addition rather than exporting raw mineral resources.

The Indonesian Nickel Smelters Association (FINI) said the revised formula provides greater certainty for smelters and could reduce the risk of operating losses and cash-flow pressures. The industry had faced higher input costs, including increased sulphur prices, which raised the cost of processing low-grade ore.

The Indonesian Nickel Miners Association (APNI) has also called for continued monitoring of the impact of the revised formula on realised ore prices, trading volumes and government revenues.

The development comes as

Indonesia continues to expand its role across the global nickel value chain. The country has become a major centre for nickel mining, smelting and battery-material production, with investments spanning conventional nickel products as well as materials required for electric mobility.

For the global nickel industry, the revised pricing mechanism could influence the economics of low-grade ore utilisation and the operating conditions of Indonesia's rapidly expanding processing sector. It also illustrates the increasing importance of domestic pricing frameworks in determining the competitiveness of energy- and resource-intensive metallurgical operations.

Global Alumina Production Recovers in July

Global alumina production increased in July 2026, although output remained below the corresponding level of the previous year, according to data from the International Aluminium Institute (IAI).

Global alumina production reached approximately 13.02 million tonnes in July, representing an increase of around 3.3% compared with June. However, production was about 2% lower than the 13.28 million tonnes recorded in July 2025.

China remained by far the world's largest alumina-producing region. Chinese output increased to approximately 7.83 million tonnes in July from 7.58 million tonnes in June. Despite the month-on-month improvement, Chinese production remained nearly 2% below the year-earlier level.

China accounts for more than 60% of global alumina production, making changes in its refinery operating rates particularly important for the



international aluminium value chain.

Outside China, production trends were mixed. Alumina production in Oceania increased by nearly 11% month-on-month to around 1.56 million tonnes. Production in Africa and Asia excluding China increased by approximately 1% to 1.14 million tonnes.

European production, including Russia, declined by nearly 4% to approximately 600,000 tonnes, while North American output increased to 168,000 tonnes from 157,000 tonnes in June. South American production declined slightly to around 998,000 tonnes.

The production data comes as the alumina market continues to experience differing conditions across regions. In China, increased refinery output has contributed to pressure on alumina prices, while a number of producers have faced challenging margins.

Market participants are closely watching production levels because alumina

availability directly affects the economics and operating rates of primary aluminium smelters. Any sustained reduction in refinery output can tighten the availability of smelter-grade alumina and increase procurement costs.

At the same time, higher production in several regions could provide additional feedstock for aluminium smelters if logistics remain stable.

The July figures therefore indicate a gradual recovery in monthly global alumina output, but the year-on-year decline highlights that the market has not yet returned uniformly to previous production levels.

Indian Foundries Target Larger Role in Global Supply Chains



Indian foundries are increasingly being positioned as potential global suppliers of ferrous and non-ferrous castings, with international OEMs and manufacturing companies looking towards India for sourcing opportunities.

The issue was highlighted during Inter Foundry and Inter DieCast 2026 in Coimbatore, where industry representatives discussed India's potential to expand its role in global casting supply chains. Participants noted that multinational companies are increasingly looking at Indian manufacturers for sourcing and supplier development opportunities.

India's established foundry clusters, relatively broad engineering ecosystem and expanding machining capabilities provide a base for supplying

components to international customers. However, industry representatives emphasised that foundries will need to continue investing in modern technologies, quality systems and delivery capabilities to meet global customer expectations.

The Coimbatore event brought together more than 300 exhibitors, including international participants and technology suppliers. A new Castings Zone was also created to showcase finished cast components directly to buyers, with overseas buyers participating in the programme.

For Indian foundries, the opportunity extends beyond supplying raw castings. Increasing levels of machining and finishing can allow manufacturers to offer higher-value components and participate more directly in global OEM supply chains.

Export-oriented foundries are also facing greater requirements concerning documentation, process consistency, material traceability and environmental compliance. These requirements are influencing investments in testing

equipment, process monitoring, automated production systems and digital quality records.

The industry is also looking at international partnerships as a route to technology and market development. The Foundries Development Foundation and Germany's VDMA, for example, have entered into an agreement aimed at strengthening cooperation and creating greater opportunities for Indian foundries to participate in international platforms such as GIFA.

The growing international interest comes at a time when global manufacturers are diversifying their supplier bases and seeking reliable sources for engineered components. For Indian foundries, this creates opportunities but also raises the importance of consistent quality, competitive lead times and technical capability.

The discussions in Coimbatore indicate that the next phase of growth for Indian foundries could increasingly be linked to their ability to move from component suppliers to integrated global manufacturing partners.

Precision Castings Gain Aerospace Order from Hindustan Aeronautics Limited

Investment & Precision Castings Limited has received a significant supply order from Hindustan Aeronautics Limited (HAL) for precision cast components intended for a strategic aerospace application.

The order, received on September 5, 2026, relates to components for combat aircraft programmes and is expected to be executed over the company's order-execution cycle. The development strengthens the role of precision casting technologies in India's expanding aerospace manufacturing ecosystem.



Aerospace casting is one of the most technically demanding segments of the foundry industry. Components must meet stringent requirements related to dimensional accuracy, metallurgical properties, internal integrity and repeatability.

Investment casting is particularly

relevant for aerospace applications because it can produce complex geometries and thin-walled components while reducing the amount of subsequent machining required. The process is used for components manufactured from a range of specialised alloys, including nickel-, cobalt- and other high-performance materials.

The new HAL order highlights the opportunities available to Indian precision foundries as aerospace manufacturing becomes increasingly localised. Domestic production of complex components can reduce

dependence on imported parts while creating opportunities for Indian suppliers to integrate into aerospace programmes.

The company operates capabilities covering investment casting as well as CNC machining and various finishing and surface-treatment processes. Such integrated capabilities are increasingly important because aerospace customers require suppliers to maintain tight control over multiple stages of component production.

For the Indian foundry industry, aerospace represents a higher-value market compared with several conventional casting applications. Entry into this segment, however, requires significant investment in process control, testing, certification and skilled technical personnel.

The HAL order also reflects the broader diversification taking place within India's casting sector. Foundries traditionally concentrated on automotive, pumps, valves, agricultural machinery and general engineering are

increasingly exploring aerospace, defence, railways and other specialised applications.

As domestic aerospace manufacturing expands, demand for locally produced precision castings could increase across engines, structural systems and other aircraft applications. For foundries capable of meeting the necessary quality and certification requirements, this represents an opportunity to move further towards high-value engineering components.

Indian Foundries Position Themselves for Global Sourcing



India's foundry industry is seeing increasing opportunities to become a larger sourcing base for international manufacturers, with global OEMs and procurement organisations showing greater interest in Indian casting suppliers.

The issue was highlighted at Inter Foundry and Inter DieCast 2026, held in Coimbatore from September 10–12, where industry representatives discussed India's potential to supply ferrous and non-ferrous castings to international markets. Speakers noted that global companies are increasingly looking towards India for supplier diversification and manufacturing partnerships.

Parag Sharma, Vice-President, Global Purchasing and Supply Chain, India and Asia Pacific Region, Stellantis, said Indian manufacturers have significant opportunities as international companies increasingly evaluate suppliers in the country. The discussion reflects the broader shift towards developing geographically diversified supply chains for engineering components.

The event included a dedicated Casting Zone, designed

to connect international buyers directly with Indian foundries. Participating companies showcased castings for automotive and non-automotive applications, including tractors, pumps, valves, hydraulics, earth-moving equipment, compressors and general engineering.

For Indian foundries, access to international customers is creating opportunities beyond traditional domestic markets. However, competing for global programmes requires consistent metallurgical quality, dimensional control, traceability, process documentation and reliable delivery performance.

Technology adoption is consequently becoming an important part of the industry's export strategy. The Inter Foundry programme included sessions on European metallurgical equipment, automated foundry technologies and best practices followed by Indian suppliers serving international customers.

The event also saw the signing of a cooperation agreement between the Foundries Development Foundation and VDMA, aimed at strengthening technical and business links between Indian and German foundry industries. Messe Düsseldorf's Bright World of Metals trade fairs are also collaborating with Inter Foundry, further connecting Indian foundries with the international metallurgy and casting ecosystem.

The developments indicate that India's foundry sector is increasingly positioning itself not only as a domestic component supplier but also as a potential global manufacturing and sourcing partner. As international buyers diversify their supplier networks, Indian foundries with strong quality systems, modern equipment and value-added machining capabilities could find expanding opportunities in export-oriented programmes.

Oriental Foundry Develops New Rail Components with Russian Partner

Oriental Foundry Private Limited, a wholly owned subsidiary of Oriental Rail Infrastructure, has entered into a Technology Development Agreement with Russia-based United Wagon Company's design and engineering centre, VNICTT.

Under the agreement, VNICTT will undertake the design and development of a 25-tonne axle-load bogie and a solid-bottom gondola car, including engineering design, technical documentation and technical support during testing. The agreement was announced on September 4, 2026.

The development provides an example of how Indian foundries are increasingly moving beyond conventional component manufacturing towards participation in the development of specialised railway equipment.

Railway applications require cast components capable of handling high mechanical loads and demanding operating conditions. Bogie components, braking systems, couplers and other railway castings therefore require controlled metallurgical properties, dimensional accuracy and rigorous inspection.

For foundries, involvement at the



design-development stage can provide opportunities to build greater technical capability. Collaboration with international engineering organisations can also provide access to design expertise, testing methodologies and international technical standards.

Oriental Foundry's agreement comes at a time when India's railway sector continues to expand procurement and modernise rolling-stock technology. Demand for freight wagons, passenger equipment and associated components provides a significant market for domestic casting and engineering companies.

The development of higher axle-load equipment is particularly relevant to

freight transportation, where increased load-carrying capability can improve the efficiency of rail-based movement. Components used in such equipment must meet higher engineering and reliability requirements.

For Indian foundries, these programmes can also encourage investments in simulation, pattern development, metallurgical testing and precision machining. The ability to participate in technology-development programmes rather than simply manufacture to established drawings can strengthen a foundry's position within the engineering value chain.

The agreement also reflects the increasing role of international technical collaboration in India's casting industry. Partnerships with overseas engineering organisations can support the development of specialised products while creating opportunities for Indian manufacturers to build capabilities that can subsequently be applied across other railway and heavy-engineering applications.

The project will progress through design, technical documentation and testing before the new equipment enters wider production.

Coimbatore Foundries Report Strong Growth as Orders Rise



India's foundry industry is seeing stronger order activity across several manufacturing segments, with Coimbatore emerging as one of the major regional centres benefiting from the improvement. Industry representatives said the Coimbatore foundry sector recorded approximately 20% growth over the past year, supported by orders from automotive, agricultural equipment and general engineering industries.

Coimbatore accounts for an estimated 1.5 million tonnes of India's annual casting production, valued at nearly ₹25,000 crore. Around ₹10,000 crore worth of castings are exported from the region each year, highlighting the importance of the

cluster to India's domestic and international foundry supply chain.

The current improvement in orders is also encouraging foundries to increase capacity utilisation. According to industry representatives, many units in the region are operating at more than 90% capacity, with demand currently exceeding available production capacity in some segments.

Automotive and agricultural equipment remain important markets, while general engineering applications are also contributing to order growth. The combination of domestic demand and export opportunities is

encouraging manufacturers to focus increasingly on machining and value-added casting production.

Around 65% of castings sold from Coimbatore are reported to undergo machining, indicating a gradual movement away from supplying basic castings towards finished and semi-finished components. This shift enables foundries to participate in a larger portion of the manufacturing value chain and meet more demanding customer specifications.

However, skilled manpower availability remains a concern for the industry. Foundries are responding

through increased investment in automation, modern equipment and digital tools to improve productivity and reduce dependence on manual processes.

The developments were highlighted during Inter Foundry and Inter DieCast 2026, held in Coimbatore from September 10–12. The exhibition brought together foundry manufacturers, technology suppliers and international participants, with discussions focusing on strengthening India's position as a global source of ferrous and non-ferrous castings.

Magnesium Die Casting Gains Attention in Mobility Sector

Magnesium die casting is receiving increased attention from India's automotive and mobility industries as manufacturers look for lightweight materials and manufacturing technologies capable of supporting vehicle weight reduction.

The subject featured prominently at Inter Foundry and Inter DieCast 2026 in Coimbatore, where a dedicated session examined magnesium die casting and its potential role in future mobility applications. Industry participants from magnesium casting, wheel manufacturing, die-casting technology and automotive engineering took part in the discussion.

Magnesium offers a combination of low density and favourable mechanical characteristics that makes it attractive for lightweight components. Its use can help manufacturers reduce component weight while maintaining the required structural and functional properties.

The increasing focus on vehicle efficiency and electrification is providing another area of interest for lightweight castings. Reducing vehicle weight can have implications for energy consumption, vehicle range and overall system efficiency, particularly in electric mobility applications.

However, magnesium casting requires specialised process knowledge. Control of melt quality, die temperature, filling conditions and solidification behaviour is important for



achieving consistent component quality. Foundries also need appropriate safety systems and process controls when handling molten magnesium.

The technology is being evaluated for applications including automotive structural and mobility components, where lightweighting can provide advantages. Die-casting

processes can further support high-volume production by producing complex shapes with relatively short cycle times.

For Indian foundries, development of magnesium casting capabilities could provide an opportunity to diversify beyond traditional aluminium and zinc die-casting applications. It could also support closer integration with automotive OEMs and component manufacturers working on next-generation vehicle platforms.

The discussion at Inter Foundry is significant because it brings lightweighting into the broader Indian casting-technology conversation. The event also included dedicated sessions on strengthening India's non-ferrous casting industry and increasing the use of European metallurgical and die-casting technologies in Indian production.

As automotive manufacturers continue to examine lightweight materials, magnesium die casting is likely to remain an area of technical development for Indian foundries, particularly those seeking opportunities in advanced mobility and high-value component manufacturing.



Performance of Base Metals - September 2026



**Metalworld
Research Team**

The base-metals market strengthened broadly during August 2026, with all five major metals recording higher LME monthly-average Cash Settlement prices compared with July. Zinc delivered the strongest increase, while copper also posted a significant gain as exchange inventories declined and nearby market conditions remained tight. Aluminium rose at a more moderate pace, while nickel and lead registered smaller monthly gains.

The improvement was also visible in the Indian market. MCX August-expiry Due Date Rates for copper, aluminium and zinc were higher than the corresponding July-expiry rates, with zinc recording the sharpest increase. Lead was broadly stable. The MCX comparison therefore points to a firmer domestic base-metals market during August, although the MCX figures are settlement rates for expiring contracts rather than

monthly-average prices.

China remained central to the supply picture. SMM data showed copper cathode production rising 1.79% month-on-month in August, while aluminium production was broadly unchanged. Refined zinc production increased by more than 2.6%, whereas refined nickel and refined lead production declined. These divergent supply trends indicate that individual metal fundamentals continued to play a larger role than a single broad market direction.

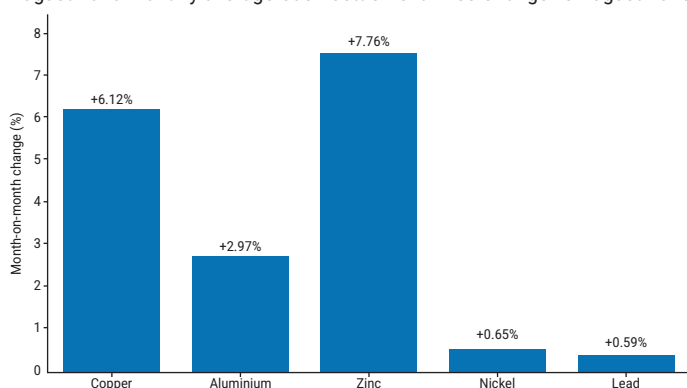
LME: Broad-Based August Recovery

LME monthly-average Cash Settlement prices showed a substantially firmer market during August.

- Copper averaged approximately US\$14,353 per tonne, compared with US\$13,525 in July, representing a 6.12% month-on-month increase. LME average stocks also declined from 294,114 tonnes in July to 227,683 tonnes in August. The combination of stronger prices and lower exchange inventories pointed to tighter immediately available material.
- Aluminium averaged approximately US\$3,250 per tonne, up 2.97% from July's US\$3,156. Average LME stocks declined from 282,350 tonnes to 251,215 tonnes. The market therefore strengthened despite aluminium production in China remaining broadly stable during August.
- Zinc was the strongest performer among the five metals. Its August cash average reached approximately US\$3,875 per tonne, compared with US\$3,596 in July, an increase of 7.76%. Average LME stocks fell from 110,753 tonnes to

LME Base Metals - September 2026

August 2026 monthly average Cash Settlement Price Change vs August 2026



Note: LME figures represent the change in monthly-average Cash Settlement prices in August 2026 compared with July 2026.

94,948 tonnes. Tightness in the nearby zinc market was also reflected in elevated backwardation during August.

- Nickel averaged approximately US\$16,766 per tonne, up 0.65% from July. Average stocks declined modestly from 272,057 tonnes to 266,050 tonnes. The relatively small price increase contrasted with continued evidence of ample supply and high inventories in the broader nickel market.
- Lead averaged approximately US\$1,855 per tonne, marginally higher than July's US\$1,844, representing a 0.59% increase. Unlike the other four metals, average LME lead stocks increased from 384,396 tonnes to 418,498 tonnes, limiting the extent of the price response.

The August LME data therefore indicates a broad improvement in pricing, but with significant differences in the underlying physical balance. LME identifies its Official Prices as reference prices for physically delivered metals, while its Monthly Average Settlement Price is calculated from the daily Official Cash Settlement Prices over the relevant business days.

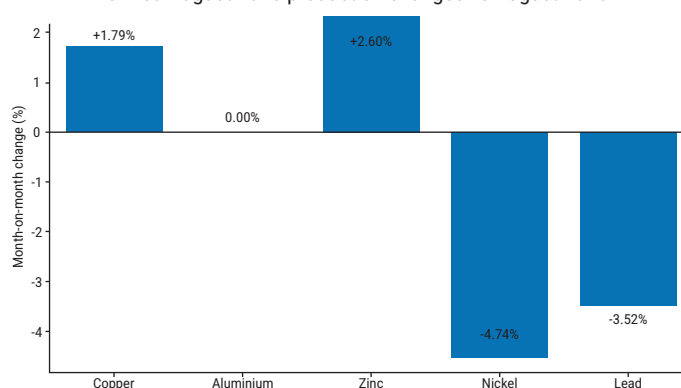
SMM: Diverging Chinese Supply Trends

China's August production data presented a more mixed picture.

- Copper cathode production reached 1.147 million tonnes, increasing 1.79% month-on-month. SMM attributed the recovery partly to the completion of maintenance at some smelters, although tight availability of anode plates continued to constrain production.
- Aluminium production was broadly unchanged month-on-month and was 2.0% higher year-on-year. SMM reported that the aluminium-water ratio increased to

SMM Base Metals - September 2026

Verified August 2026 production changes vs August 2026



Note: SMM production figures are shown only where a comparable August 2026 month-on-month figure could be verified. No estimates have been used to fill data gaps.

78.8%, while domestic aluminium ingot production declined 2.3% month-on-month.

- Refined zinc production increased by more than 2.6% month-on-month, as several smelters resumed production following maintenance. However, output remained nearly 8.7% below the previous year, with profitability and unexpected maintenance continuing to constrain some producers.
- Refined nickel production declined by approximately 4.14% month-on-month to around 30,100 tonnes, according to SMM-derived data. The decline came against a broader backdrop of high inventories and weak demand conditions.
- Lead production was also under pressure. SMM reported that China's August refined-lead production declined 3.52% month-on-month, while year-on-year growth moderated to 6.78%. Secondary lead production alone fell 2.33% month-on-month to 165,500 tonnes.

The Chinese supply picture was therefore clearly differentiated: copper, aluminium and zinc saw either recovery or stability, while nickel and lead experienced production declines.

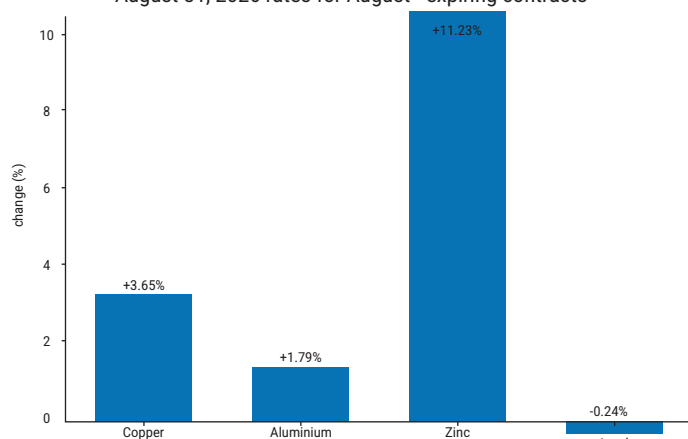
MCX: Zinc Leads the Domestic Market

MCX settlement data also showed a firmer domestic market during August.

- The August-expiry Due Date Rate for copper was ₹1,401.80/kg, compared with ₹1,352.45/kg for the July expiry, an increase of 3.65%.
- Aluminium rose 1.79%, from ₹341.05/kg to ₹347.15/kg.
- Zinc recorded the strongest increase, with its August-expiry rate rising from ₹384.65/kg to ₹427.85/kg,

MCX Base Metals - September 2026

August 31, 2026 rates for August - expiring contracts



Note: MCX figures represent the August 2026 and July 2026 expiry Due Date Rates and their calculated percentage change. They are not monthly-average prices. Nickel is excluded from the comparative chart because its August contract expired on August 19 rather than at month-end.

equivalent to an 11.23% increase.

- Lead, in contrast, was almost unchanged, moving from ₹204.95/kg to ₹204.45/kg.
- The August nickel contract expired on August 19, with a Due Date Rate of ₹1,624.50/kg. Because the nickel contract's expiry timing differs from the month-end expiry used for the other base metals, it has not been included in the month-end July-August comparison chart.

COMPARATIVE SNAPSHOT – SEPTEMBER 2026 DATA PERIOD - AUGUST 2026

Metal	LME Aug vs July	SMM Aug Production vs July	MCX Aug Data vs July
Copper	+6.12%	-1.97%	+3.65%
Aluminium	+2.97%	0.00%	+1.79%
Zinc	+7.76%	+260%	+11.23%
Nickel	+0.65%	-4.14%	N/A
Lead	+0.59%	-3.52%	-0.24%

***Nickel's August contract expired on August 19, so it is not directly comparable with the month-end expiry rates used for the other MCX metals.**

Conclusion: A Firmer Market, But With Diverging Fundamentals

August 2026 marked a clear improvement in base-metal pricing compared with July. Unlike the previous month, when LME performance was mixed, all five major metals

recorded positive monthly-average price movements. Zinc and copper led the advance, supported by lower exchange inventories and tighter nearby market conditions.

- Copper enters September with a stronger physical backdrop. The combination of a 6.12% increase in its LME monthly average, falling exchange stocks and continuing constraints in the copper-concentrate and anode markets keeps supply availability at the centre of the market discussion.
- Aluminium also moved higher, although the increase was more moderate. Stable Chinese production and a decline in LME stocks point towards a market where supply remains available but physical conditions have become somewhat tighter.
- Zinc was the standout performer. The combination of a 7.76% increase on LME, an 11.23% increase in the MCX expiry rate and declining LME stocks reflects a particularly firm market environment. However, China's refined-zinc production also increased in August, which could add supply pressure if smelter operating conditions continue to improve.
- Nickel remained fundamentally different. Its LME monthly average increased only marginally despite a decline in Chinese refined-nickel production. High inventories and continuing supply availability remained important factors limiting the strength of the price recovery.
- Lead also recorded only a marginal LME increase, while Chinese production declined and LME stocks rose. The balance between constrained secondary-lead supply and elevated exchange inventories will remain important for the market going forward.

Looking ahead, market participants will continue to watch Chinese industrial demand, exchange inventories, concentrate treatment charges, smelter operating rates, Indonesian nickel supply and global manufacturing conditions. August showed that the broad direction of base metals can improve even while individual supply-demand balances remain significantly different.

Editorial Note:

The September 2026 issue presents August 2026 market data. Figures have been included only where comparable source data could be verified. No estimates have been used to fill data gaps.

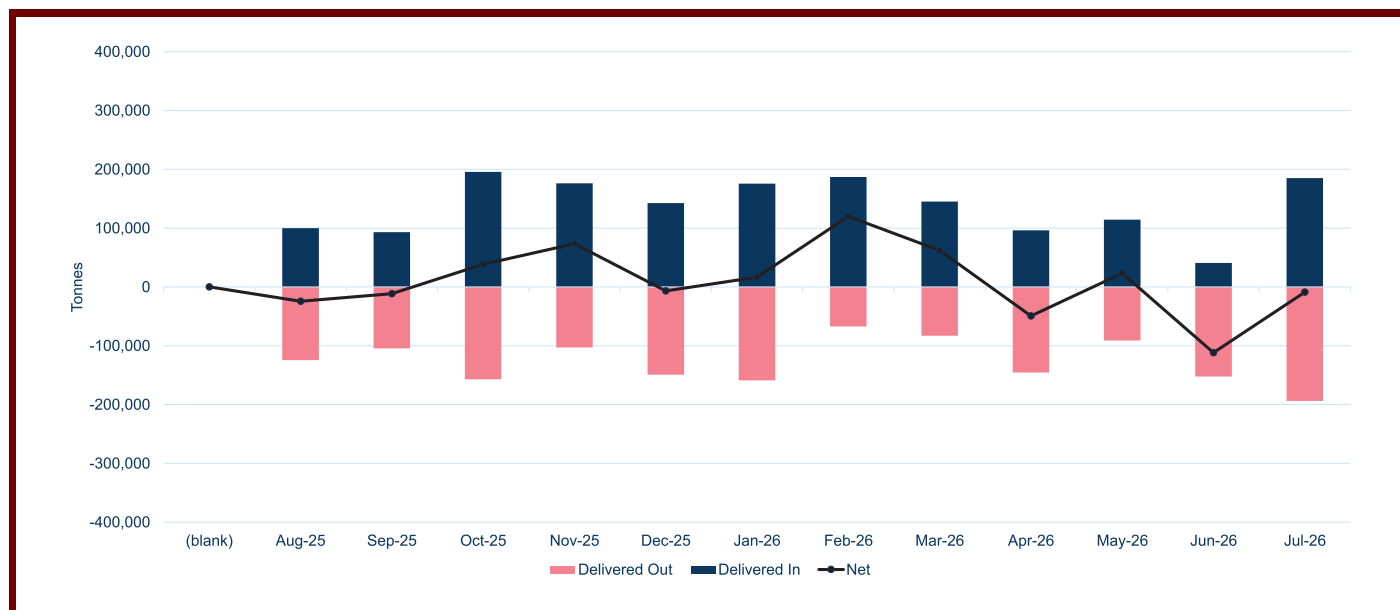
BASE METALS WATCH

London Metal Exchange Prices - August 2026

Contract	OFFICIAL CASH SETTLEMENT PRICE				OFFICIAL 3 MONTH PRICE			
	Average	Low	High	*M/M Change %	Average	Low	High	*M/M Change %
LME Aluminium	\$3,249.63	\$3,182.00	\$3,373.00	3.0%	\$3,251.23	\$3,183.00	\$3,374.00	3.2%
LME Aluminium Alloy	\$3,200.00	\$3,200.00	\$3,200.00	-1.9%	\$3,200.00	\$3,200.00	\$3,200.00	-1.9%
NASAAC LME NASAAC	\$2,750.00	\$2,750.00	\$2,750.00	0.0%	\$2,750.00	\$2,750.00	\$2,750.00	0.0%
LME Copper	\$14,353.40	\$13,945.00	\$14,850.00	6.1%	\$14,155.73	\$13,876.00	\$14,370.00	4.5%
LME Lead	\$1,855.05	\$1,827.00	\$1,880.00	0.6%	\$1,897.15	\$1,872.00	\$1,919.00	0.6%
LME Nickel	\$16,765.75	\$16,575.00	\$17,125.00	0.7%	\$16,953.25	\$16,775.00	\$17,310.00	0.6%
LME Tin	\$55,654.00	\$54,375.00	\$56,500.00	4.8%	\$55,913.50	\$54,755.00	\$56,695.00	4.8%
LME Zinc	\$3,875.13	\$3,730.00	\$4,107.00	7.8%	\$3,773.13	\$3,652.00	\$3,933.00	5.7%
LME Cobalt	\$55,853.75	\$55,840.00	\$55,870.00	0.0%	\$56,290.00	\$56,290.00	\$56,290.00	0.0%

Source : LME

Monthly Warehouse Stock Movements - LME



Source : LME

Multi Commodity Exchange Prices - July 2026

	HIGH	LOW	OPEN	CLOSE	%CHANGE
ALUMINIUM	348.60	347.30	346.50	347.05	-0.30
COPPER	1414.95	1406.75	1408.90	1404.00	0.07
ZINC	436.00	434.30	433.55	430.40	0.07
LEAD	197.80	196.15	196.60	195.70	0.05
NICKEL	1612.50	1596.10	1606.00	1595.00	-0.07

Source : MCX

INDIAN AUTOMOBILE MONITOR
AUGUST 2026

Numbers of Vehicles

	PRODUCTION			DOMESTIC SALES			EXPORTS		
	APRIL - AUGUST			APRIL - AUGUST			APRIL - AUGUST		
	2025-26	2026-27	% Change	2025-26	2026-27	% Change	2025-26	2026-27	% Change
PASSENGER VEHICLES (PVS)									
PASSENGER CARS	6,78,782	7,82,120	15.2%	4,89,838	6,11,968	24.9%	1,83,602	1,54,190	-16.0%
UTILITY VEHICLES	12,60,866	15,59,407	23.7%	10,42,436	13,62,527	30.7%	1,65,877	2,03,582	22.7%
VANS	66,241	71,463	7.9%	61,761	70,201	13.7%	4,389	2,781	-36.6%
TOTAL PASSENGER VEHICLES	20,05,889	24,12,990	20.3%	15,94,035	20,44,696	28.3%	3,53,868	3,60,553	1.9%
THREE WHEELERS									
PASSENGER CARRIER	4,35,083	5,82,284	33.8%	2,60,209	3,33,934	28.3%	1,75,887	2,58,151	46.8%
GOODS CARRIER	50,030	64,097	28.1%	45,536	62,526	37.3%	2,438	1,436	-41.1%
E-RICKSHAW	4,402	4,010	-8.9%	4,990	5,119	2.6%	23	3	-87.0%
E-CART	1,875	2,056	9.7%	2,024	2,138	5.6%	-	3	-
TOTAL THREE WHEELERS	4,91,390	6,52,447	32.8%	3,12,759	4,03,717	29.1%	1,78,348	2,59,593	45.6%
TWO WHEELERS									
SCOOTERS	33,66,511	44,77,626	33.0%	30,17,666	38,69,616	28.2%	2,68,545	3,58,993	33.7%
MOTORCYCLES	67,62,654	78,35,471	15.9%	49,00,194	55,16,690	12.6%	17,23,283	22,99,499	33.4%
MOPEDS	1,99,457	2,48,021	24.3%	1,87,238	2,37,403	26.8%	11,022	4,068	-63.1%
TOTAL TWO WHEELERS	1,03,28,622	1,25,61,118	21.6%	81,05,098	96,23,709	18.7%	20,02,850	26,62,560	32.9%
TOTAL QUADRICYCLE	1,708	5,183	203.5%	4	4	0.0%	1,698	5,202	206.4%
GRAND TOTAL	1,28,27,609	1,56,31,738	21.9%	1,00,11,896	1,20,72,126	20.6%	25,36,764	32,87,908	29.6%

* BMW, Mercedes, JLR, Tata Motors and Volvo Auto data are not available
Society of Indian Automobile Manufacturers (13/09/2026)

Source: SIAM

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