TENTH EDITION

e-Newsletter

Key Enabling Factors for Indian Mining Metals & Cement Sector

Mines, Metals & Cement Division

CONTENT

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Message

Indian Mining sector has significant potential to impact social inclusion and economic development. The mining industry contributes significantly to the GDP of the country, while creating immense employment opportunities in both skilled and unskilled human resource. The sector provides raw materials to various infrastructure downstream industries like aluminium, steel, power, cement and others, playing a pivotal role in the National Mission of Atmanirbhar Bharat.

As we recently celebrated our 75th Independence Year and moved into the Amrit Kaal Journey for next 25 years, The Ministry of Mines is making dedicated efforts to accelerate the growth momentum of the mining industry in India. During the last few years, the Government has introduced important reforms to open up the mineral sector to ensure its contribution in achieving the national policy goals. With the recent Amendments in the MMDR Act, Ministry of Mines has brought transparency in allocation of resources and removed the hurdles in the growth journey ahead. The initiatives taken would spur the mineral production and supplies, promote ease of doing business and enhance the cost competitiveness of the sector.

Due to limited availability of mineral resources, it becomes imperative to utilize these resources with their potential capacity along with highest safety and environmental standards, while also exploring mutually beneficial collaborations with Mineral rich countries especially for these minerals which are essential to meet the commitment of the country under CoP26.

In recent years, the country has witnessed an acceleration in investments in disruptive technologies that has helped the Indian mining industry to catch up with the global dynamics. Technologies such as big data, drones, automated machinery, electric vehicles, digital twins, water management, and renewable energy generation have gained momentum and are being implemented within mining sites. It is imperative for the Indian mineral sector to adopt the best practices and technologies available for increasing productivity, efficiency, adoption of environmentally sustainable operations and practices, decarbonization, among others.

I am pleased to note that this FICCI e-newsletter would highlight key enabling factors defining the growth of Indian Mining sector. The newsletter further presents a platform to deliberate on the importance of mining sector and how it contributes to the growth trajectory of the nation.

My best wishes to the readers.

(Dr. Veena Kumari D)

SATISH PAI
MANAGING DIRECTOR

2nd January 2023

Non-ferrous metals are uniquely placed to deliver on societal aspirations of the present day as well as the emerging future. Their exceptional lightweight, conductivity and strength characteristics, coupled with endless recyclable capabilities, make these metals indispensable in our current economic scenario. Non-ferrous metals are the wonder metals that will support our endeavour to achieve the energy, sustainability, and resource efficiency goals, that our nation has set for itself in the drive towards net zero and decarbonization.

The non-ferrous metals industry has been growing steadily for the past few years, making a significant contribution to the Indian economy. The industry expects strong growth opportunities for the manufacturing sector in general, and non-ferrous metals in particular, by leveraging initiatives like Atmanirbhar Bharat, Smart Cities and Gati Shakti. The initiative to promote electric vehicles in India is leading to an increasing demand for Aluminium, Copper and Lead batteries.

India is endowed with large deposits of high-quality bauxite ore, resources for power generation (coal) and a formidable pool of manpower – both skilled and unskilled. The Indian aluminium industry is forging ahead with rapid expansion in both, primary metal, and downstream sectors. The nation's aluminium consumption is driven by the demand for power (48%), automobiles (15%), construction (13%), industrial (7%) and consumer durables (7%).

The government has introduced several reforms and initiatives to tackle the ever-rising imports of non-ferrous metals and boost growth prospects for the non-ferrous metals sector. This has given renewed vigour to the domestic industry to enhance the indigenous production of non-ferrous metals.

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Many companies have already started investing in setting up dedicated facilities using high-end alloys of aluminium in the manufacturing of defence and aerospace components, as well as in the transportation, building and construction sectors, which will pave the way for enhanced usage of aluminium in the country, especially in emerging applications.

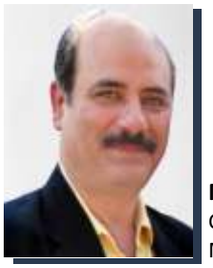
All such initiatives holistically translate into a greater use and demand for non-ferrous metals in the country. The Indian Non-Ferrous Metals industry is strategically well-placed and is one of the largest producers in the world with discernible growth plans and prospects for the future, across several base metals like aluminium.

With per capita consumption for most of the non-ferrous metals in India being well below the world average, there is tremendous scope for further development and growth of the industry, which would also support the economic development targets for 2030 & 2047, under Amrit Kaal.

This e-newsletter is a good compilation of industry insights, highlighting the opportunities in the growth journey ahead, finding remedial solutions to the challenges and marking our transition towards the 100th year of independence. Happy reading!

Regards,

Satish Pai



Mr. Pankaj Satija
Co-Chair, FICCI Mining Committee, and
Managing Director, Tata Steel Mining Ltd.

Minerals account for crucial natural resources acting as a bedrock providing critical raw materials for industries and defining the industrial growth of a country. Indian mining sector is crucial for nation's economic growth. It is responsible for building the industrial backbone by providing raw materials to most of the downstream industries like power, steel, aluminium, etc. The growth of the sector is imperative to achieve the ambitious target of US$ 5 trillion economy. Aligning the goals with Hon'ble Prime Minister's Vision of Atmanirbhar Bharat, it becomes necessary to convert mineral resources to valuable resources in the form of commodities.

We applaud the Government of India for introducing various progressive reforms to enhance productivity, efficiency and mineral production in the nation. These reforms have provided fair and equal opportunity to the industry in terms of lease allotment, land allocation, capital availability and deployment of latest technologies to contribute to the growth of the Indian mining industry, contributing to country's GDP and creating employment opportunities. The policies have evolved over time with requisite amendments to keep the sector domestically as well as globally competitive.

As India has abundant mineral resources, out of which a significant portion is yet to be utilized, we firmly believe that these reforms will play a fundamental role in enhancing the mining sector's contribution to the GDP and in boosting employment, contributing immensely to the National Mission of Atmanirbhar Bharat and Self-Reliant India.

There has been emerging focus on deep-seated, critical new age and strategic minerals. Driven by the demand from emerging applications in the energy sector, communications, space industry, nuclear industry electrc vehicles, usage in maritime & defence and healthcare, the minerals like lithium, cobalt, nickel, graphite, rare-earth elements, lead, zinc and others are going to witness increased focus, demand and production, terming the current decade to be the era of energy intensive minerals.

The country has witnessed an acceleration in investments in disruptive technologies that have helped the Indian mining industry catch up with global dynamics. Technologies such as big data, automated machinery, electric vehicles, digital twins, water management, and renewable energy generation have gained momentum and are being implemented within mining sites worldwide & in India. Such practices would go a long way in increasing mineral productivity and operational efficiencies in the sector.

The mineral industry also has the responsibility to meet net zero in its own processes. A robust sustainable development framework, with renewed focus on biodiversity, water and green mining will help in driving the industry towards the sustenance of environment and humanity.

This FICCI e-newsletter provides an excellent opportunity for all industry stakeholders to gain insights and credible information on key growth determinants for the sector that can play a vital role in furthering the sector's growth agenda.

I wish everyone a happy reading. Thank you.

Mr. V R Sharma
Co-Chair, FICCI Mining Committee, and
Vice-Chairman, JSP Group Advisory Services

The steel sector is one the crucial sectors of Indian economy due to its strong forward and backward linkages and its integration with consumer base industries. It has been contributing significantly to the country's economic growth for many years. The growth in the industry is largely driven by domestic availability of raw materials like iron ore and cheap & skilled labour. The Indian steel industry accounts for about 2% to the country's GDP and is the second largest producer of steel after China.

Steel, as we all know, is the foundation of a New India and would continue to be so in the times to come. It is the primary raw material for infrastructural development, and manufacture of end-use products. Steel sector holds utmost importance in the holistic development of the nation, fueling up the major industries and capital formation.

Capacity for domestic crude steel has expanded from 138 mtpa in 2017 to 154 mtpa in 2021. Parallelly, the crude steel production grew from 101 mt in 2017 to 118 mt in 2021. With production of total finished steel at 112 mt for 2021, India was a net exporter of finished steel with exports at 12.8 mt at an annual growth of more than 26%.

Indian steel industry has a huge potential for domestic demand. There exists a strong correlation between the economic development and production as well as consumption of steel per capita, which we will inevitably witness in coming years as there are host of opportunities for our steel producers with various infrastructure development initiatives taken by the Governments.

With our government's policy announcements and changes in global supply-demand equations across sectors including railways, road, aviation, gas pipelines and housing, the sector is expected to witness significant growth in the coming years due to increase in investment in infrastructure, construction and industrial production, driving the demand for steel in India. There is a whole new rural world evolving under the wave of urbanization, thereby creating huge potential for steel and opening newer opportunities.

Further, the Steel and iron sectors globally result in almost 7% of total CO2 emissions, therefore, radical changes in technologies are required for iron and steel production to make the process greener and more sustainable. Technologies like Coal Gasification should be adopted in steel-making. Jindal Steel and Power Limited (JSPL) is already using the coal gasification technology at its Angul plant in Odisha.

To promote a circular economy we need to use scrap to produce steel. The government may consider the immediate rollout of “One Nation One electricity tariff” policy so that the scrap can be melted in different regions with uniformity in electricity tariff.

This e-newsletter is an excellent platform to share industry insights, keeping the stakeholders abreast of the latest developments and highlighting the trends & opportunities in the industry.

Happy reading to all. Thank you

Mr. Nilesh Narwekar
Co-Chair, FICCI Cement Committee and CEO
JSW Cement Ltd.

Cement is the basic raw material used in construction of buildings, urban housing and infrastructure development which are focused towards building a New India 2047. Cement industry has utmost economic significance because of its contribution in economic growth and employment, both skilled and unskilled. The sector is of immense importance to the developing and emerging economy like ours as it has strong forward & backward linkages in the economic and industrial framework.

India is not only one of the major cement producing countries of the world but is also one of the largest cement consumers. The proliferating demand for cement is primarily driven by growth in end-use sectors like infrastructure and construction. India is the second largest cement producer after China, with an installed capacity of 540 MTPA with total production of 351 MTPA. Therefore, the cement industry's contribution in the nation's growth trajectory is indispensable.

Carbon neutrality in the sector is one of the critical aspects being pushed by global commitments to a greener and cleaner environment. Globally, cement contributes about 5% of the total CO2 emissions. The industry has been making efforts for CO2 emission reduction and has made remarkable progress of reducing CO2 emission levels by about 36% between 1996 and 2017.

The industry has continuously been adopting technical energy efficiency solutions including significant scale up of and accelerating the use of alternative fuels through waste co-processing and enhancing its renewable energy portfolio through solar and wind power. Furthermore, the use of Waste Heat Recovery has gained momentum over the past few years. Majority of the cement industry initiatives are aimed at minimizing climate risks while leveraging the business opportunities for sustained growth for the benefit of all stakeholders. In addition, Indian cement industry has taken significant steps towards water harvesting both within its own operations as well as in the communities in which it operates.

As India has a high quantity and quality of limestone deposits domestically, the cement industry promises huge potential for growth. Further coupled with Government initiatives, such as development of smart cities and Gati Shakti Initiative, the sector is expected to get a major boost in the forthcoming years.

I believe this e-newsletter is a great platform to get insights on critical factors affecting the growth trajectory of Indian cement industry, highlighting the current trends and opportunities that lay ahead.

Wish everyone a happy reading.

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CEOs' Speak

EXCLUSIVE INTERVIEW

Mr. David Crowther
Technical Consultant Vanitec Ltd.

1. **Vanadium Redox Flow Battery uses vanadium electrolyte to store energy and enable wider use of renewable power generation such as wind and solar. Going forward, how do you think VRFB will enable the future of green energy in India and will facilitate green economy?**

   Long duration energy storage provided by VRFBs can supply zero-carbon green energy to the grid during times of insufficient renewable output and can be used to save excessive renewable energy. Energy storage can also play a critical role achieving energy security in remote locations with limited access to grid connected power.

   VRFBs have a number of advantages compared with other battery technologies. These advantages include: large capacity, long lifespan of 20yrs, no risk of thermal runaway and fire, 100% depth of discharge without performance degradation, and full re-use of vanadium on system de-commissioning.

   At present India has 5 operational VRFBs with a total storage capacity of 900kwh. India's first net-zero building in Bhopal incorporates a VRFB with a capacity of 300kwh. VRFB deployment is expected to increase rapidly in India and throughout the world, making an increasing contribution to the deployment of zero-carbon green energy. A recent report by Guidehouse Insights expects the use of VRFBs to increase 22- fold by 2031, as demand for long-duration energy storage increases worldwide.

2. **Commitments to Glasgow Summit has cast a spotlight on the importance of decarbonization and sustainability by supporting long-term use of resources to meet current and future needs while eliminating any adverse impact on the environment. Crucial to decarbonization and sustainability is the reuse of finite resources in a circular economy, to use existing materials for as long as possible. In**

this context, what role do you think Vanadium will play as a sustainable metal of the future, especially in steel sector?

Steel, including vanadium containing steel, is an inherently recyclable material. Steel produced via electric arc furnaces can use 100% recycled scrap, and even steel produced via the blast furnace route can typically incorporate around 20% scrap.

The majority of vanadium is produced using steel slag enriched in vanadium oxides as a co-product of the steel industry. A significant amount of vanadium is also produced from secondary sources such as spent catalysts from the chemical industry and ash from the combustion of coal and oil. The EU recently reported an end-of-life recycling input rate for vanadium of 44%. Vanadium and vanadium containing steels make a significant contribution to a circular economy. As mentioned previously, vanadium electrolyte used in VRFBs can also be re-cycled after the battery is de-commissioned.

3. **Globally, the iron and steel sector is currently responsible for about 8% of final energy demand and 7% of energy sector CO2 emissions (including process emissions). The steel sector is one of the most challenging sectors to decarbonize, as modern economies brace for an unprecedented transition with deep decarbonization of industrial practices, there is considerable concern about the sourcing and utilization of limited natural resources. In this context, how can adoption of Vanadium help in decarbonization of hard-to-abate sectors?**

Vanadium additions are used in a wide variety of steels as a strengthening element. The increased use of higher strength steels containing vanadium allows a reduced quantity of steel to be produced and used, enabling an overall reduction in carbon emissions. For example, in steel sections used in the construction industry a vanadium addition of approximately 0.04% could result in yield strengths of 350MPa. Compared with a lower strength mild steel section, it has been estimated that the use of higher strength vanadium containing steels results in a reduction of the steel required by 6%.

Unlike some alloying elements used in steel, vanadium is produced in a wide range of geographical locations. It is anticipated that increased demand for vanadium could be met by expanding production at existing facilities, and by new start-ups.

4. **What are your current products / services to cater to the requirements of Indian steel industry? And what are your expansion plans for meeting the growing demand for vanadium? Would you also like to shed some light on the key players Vanitec is partnering with and projects where Vanitec is**

sponsoring in India? Are there any other projects in the pipeline whose benefits you intend to demonstrate to the Indian steel players?

Vanitec was formed in 1972 with the aim of promoting the use of vanadium bearing materials and has supported over 200 research projects. Information on the use of vanadium in steels and for other applications is freely available, and Vanitec is keen to sponsor research projects in India which demonstrate new applications for vanadium, both in steels and other materials.

Vanitec anticipates an increased demand for vanadium in the future due to an increase in steel production, an increased use of vanadium in steels, and also increased use of vanadium in new technologies such as VRFBs. Vanadium production could be increased both by existing producers and by new start-ups. For example, a number of new projects in Australia are expected to start production in the near future and increase the supply of vanadium worldwide.

At present Vanitec is supporting two projects in India. At IIT Kharagpur, a project is being carried out in conjunction with SAIL to develop high strength vanadium containing steel sections. At IIT BHU Varanasi, another project is underway with Jindal Steel and Power as a partner, with the objective of developing high strength normalized plate steels.

Vanitec is also supporting several other projects around the world developing new types of vanadium containing steels, such as high strength dual phase steels for automotive applications, and it is the intention to share the results from these projects when they are completed.

As well as supporting steel research, Vanitec also sponsors research at Texas A&M University in the USA which aims to demonstrate the benefits of using vanadium to help with the transition to a low carbon economy. Again, the results of this research will be publicized and made generally available.

5. **Vanadium plays an essential role in providing high strength and cost-effective solutions for various end-use sectors like construction, automotives, aerospace, etc. What are your views on the current state of vanadium adoption in India for the Indian steel industry? Would you like shed light on any recent developments in production of Vanadium in the country?**

India is now the world's second largest steel producer with ambitious plans for increased steel production in the future, and already India produces a wide range of vanadium containing steels.

However, the specific consumption of vanadium for use in steel in India is 0.039kg of vanadium per ton of steel, which is low compared with the world average of 0.06kg/t. This indicates that India has a

great potential for increased production of high strength vanadium containing steels, and Vanitec is keen to support this transition to increased high strength steel production and use.

In the past India has produced vanadium from a vanadium-rich sludge produced as a co-product from the aluminium industry, but at present this production route is not operating. The Indian Bureau of Mines has identified 24.6 million tons of vanadium ore. More recently a significant deposit of vanadium hosted in carbonaceous shales was identified in Arunachal Pradesh with an average grade of 0.76% V_2O_5, raising hopes for significant Indian vanadium production in the medium term.

6. **Vanadium availability in India is limited. How do you see the future production, demand and trade scenarios for vanadium in India? What would be your key recommendations related to metallurgy for vanadium alloyed steel and what role can academic institutes play along with vanadium manufacturers & steel industry for its promotion?**

As vanadium production increases to support increased demand from the steel and VRFB sectors, vanadium production from existing sources will increase and new suppliers will enter the market, presenting additional sourcing options for Indian vanadium consumers.

Vanadium is well known in the steel industry as a strengthening element, but it also has other advantages which need to be recognised and promoted. For example, vanadium containing steels show relatively few defects during casting, and do not significantly increase mill loads during rolling. These lower rolling loads can promote faster rolling rates, reduced roll wear, and allow a wider dimensional range to be produced. This makes vanadium steels especially suited to modern mill configurations using thin slab casting and direct rolling. Vanadium additions can also help to reduced hydrogen embrittlement, which is becoming a topic of increasing significance as very high strength steels are developed.

It is important that these and other benefits of vanadium are recognised and communicated widely, and Vanitec is keen to partner with academic institutions & steel companies to promote this knowledge by organising, sponsoring, and participating in conferences and research seminars.

Note: Inputs & Views are personal of the author (s) and not necessarily of FICCI

Vanitec

Expanding Developing Markets and Promoting a Stronger Vanadium Industry

Vanitec is the only not-for-profit international global member association whose objective it is to **promote the technical and economic benefits of vanadium** and thereby increase consumption in existing and developing applications including steel, titanium alloys and chemicals.

Its membership includes global companies and organisations involved in the mining, processing, manufacture, research and development, technology development and use of vanadium and vanadium-containing products.

Vanitec advocates for the increased use of vanadium as **a critical metal in enabling a greener future.**

Visit https://vanitec.org/ for more information.

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Industry Perspective

VISION 2047: Is India Copper Ready?

Mr. Puneet Khurana
CEO
Vedanta Ltd (Sterlite Copper) & Fujairah Gold.

The Global Power Struggle and Indian Manufacturing

The past decade has witnessed an increase in the display of expansionist behaviour by China. China's expansionism has naturally resulted in growing fissures in U.S-China relations. ***Companies, once eager to be a part of China's manufacturing ecosystem, are actively looking for alternatives to de-risk.*** This has provided India an enormous opportunity to become an investment destination. In this backdrop, Prime Minister Narendra Modi's call for an "*Atmanirbhar Bharat*" is significant. ***At its heart, the call for an "Atmanirbhar Bharat" envisions a manufacturing sector that caters to growing domestic demand by augmenting existing manufacturing capacity and using surplus capacity for exports***. Implicit in this aim is the need to reduce dependence on imports in those products for which capacity & capability exist within India.

Contribution of The Indian Primary Copper Industry to the Indian Economy

Today, the scenario of copper is like crude oil. India does not have reserves and further reserves, if present, are yet to be explored. However, India has become self-sufficient in the second stage of the copper value chain, which is smelting & refining. This was not the case 25 years ago as India was dependent on imports of refined copper. This impacted industries in sectors such as wire & cables. In 1997, the Indian Primary Copper Industry recognized this challenge and invested close to INR 10,000 crore[1] to install copper smelters, which made India "Atmanirbhar" for refined copper. The industry has supported the growth of the downstream industry from less than 100 units in 1996 to over 1000 units today. The industry has also created an ecosystem which supports a finished goods[2] sector worth INR 1,29,000 crore in 2022. The industry's commitment to ensure adequate availability of raw material for SMEs and MSMEs remains as

[1] In present value terms. At present the cost of installing a 1 million MT per annum copper smelter is INR 10000 crore
[2] Transformers, Air Conditioners, Refrigerators, Compressors, Fans, Winding Wires, & Compressors

firm as it was in 1997. At present we have ability to produce 1 million metric tons of refined copper per annum in the country and further 1 million metric tons of capacity will be operational by 2030. However, in this continual journey towards *Atmarnirbharta* the industry faces challenges which surely can be overcome with the support of the Government of India.

The Role of Copper in India's Clean Energy Transition

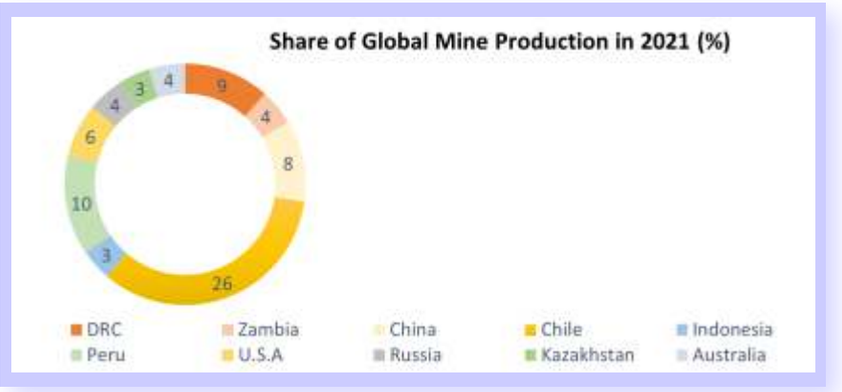
Prime Minister Narendra Modi's vision to be carbon neutral by 2070 will bring a shift in mobility and power generation. By 2030, India has set a target of achieving 500 GW renewable energy capacity & 30% of total vehicle sales to be electric. This rapid scaling of renewable energy will be catalysed by refined copper. Electric vehicles & offshore wind power generation carry 4x copper intensity than traditional vehicles and coal & hydel power respectively. Similarly, solar & wind power generation carry 2x copper intensity than coal and hydel power generation. Copper is also used extensively in long duration energy storage platforms such as battery charging infrastructures. India's transition to clean energy will be a copper intensive transition.

Role of Copper Smelters

Currently, India has unexplored copper reserves and remains import dependant for supply of copper raw materials. Copper smelters have endured the same by securing multiyear long-term agreements with copper mines globally to ensure stable supply of copper concentrate (base raw material). However, with rising demand, India's supply security is endangered. Only a policy environment conducive for the growth of copper smelters will protect the same. Major hurdles to smelter capacity growth can be solved if the Government of India reverses the inverted duty structure & maintains a stable duty differential of 5% between raw material and finished products.

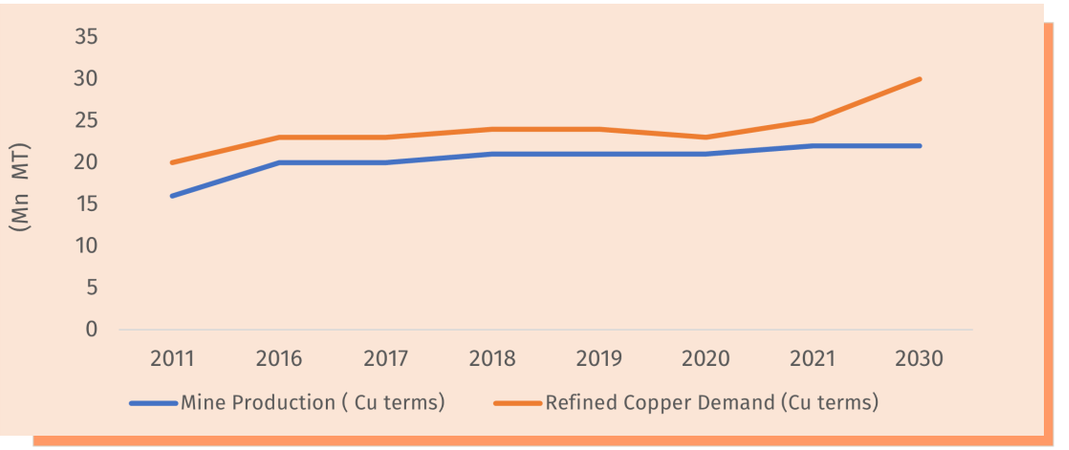
Challenges Facing India's Copper Industry

Domestic mine production satisfies merely 6% of domestic demand forcing India to focus on securing imports of raw material. Securing raw material remains a challenge as production of raw material from copper mines is highly concentrated. Ten countries account for over 75% of raw material production from copper mines.



Source: Wood Mackenzie, 2022

In addition to concentrated production, the availability of raw material has also remained tight over the past decade. Between 2011-2021, the market has experienced a deficit of 3 million metric tonnes between mine production and refined copper demand. The gap between supply and demand is forecast to increase from 3 million metric tonnes at present to 8 million metric tonnes by 2030 (Wood Mackenzie, 2022).

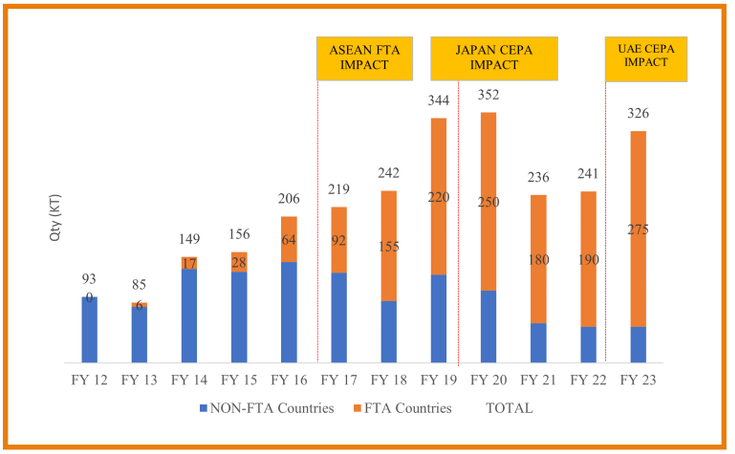


Source: Wood Mackenzie, 2022

India can look at neighboring countries like China, Japan, and South Korea for policy insight. They have taken measures aimed at securing supply of raw material in the short and long run. ***In India, the duty on the import of copper concentrate & blister copper (copper raw material), is 2.5% & 5% respectively. On the other hand, South Korea and Japan levy an MFN duty of 0% on the import of copper concentrate & blister copper.*** This allows copper smelters in Japan and South Korea to source duty free raw material from a wide basket of countries at present. Additionally, China has acquired majority stake (> 50% equity) in 24 copper mines, globally. Japan has also followed a suit, by acquiring stake in five of the world's largest copper mines.

Offshore resource acquisition is the only way to secure raw material supply and protect India from the tide of rising resource nationalism by mine producing countries. To make matters worse for India, recently, Indonesia has announced a ban on the export of copper concentrate from 2023. Previously, the Democratic Republic of Congo, Africa's largest miner, enacted a ban on the export of copper concentrate in May 2021 with a few exceptions. So, of the ten countries with copper mines, two have ceased to be sourcing avenues. Thus, India to needs engage in offshore copper mine acquisition to sanitize its raw material supply from resource nationalism.

The second challenge facing the industry is rising imports of refined copper at nil duty via free trade. By taxing the raw material and removing taxes on finished goods, an inverted duty structure has, in effect, been created. As a result, imports via FTA's account for 27% of India's domestic market despite India possessing sufficient production capacity.



Source: Industry Inputs & DGFT, 2022[3]

In 2022-23, FTA import share could account for 40% of India's market due to India's FTA with the UAE. These imports come into India with minimal value addition, hurting the Indian copper industry. For instance, in India, the copper industry purifies copper concentrate (26-32%) into refined copper (>99%), a value addition of close to 12%. However, in the UAE, the copper industry just physically changes the shape of imported copper cathodes (> 6mm diameter) into copper wires (<6mm diameter), a value-add of less than 2%.

Furthermore, FTA imports into India is principally from countries like Japan (70% of India's refined copper imports) & the ASEAN. These countries access raw material at duty of 0% unlike Indian producers. Additionally, countries like Japan exports only its production surplus. In this backdrop, there needs to be an urgent review in India's existing tariff structure and trade policy with the intention of promoting self-reliance in copper. India should not be afraid of global opinion via the WTO, as countries such as Indonesia have taken steps to boost domestic smelter production in their national interest.

A third major supply side challenge facing India is the absence of circular economy in India's copper industry. India's recycling rate of copper scrap is close to 20% as per the Ministry of Mines. This is far below the global benchmark recycling rate of copper scrap which close to 80%.

Developed countries appear to be taking advantage of this situation. Imports of poor-quality copper scrap like druids are being routed to India from countries like the West (UK, USA & EU). With only 50% copper content, druids carry 50% waste with them, leading to waste dumping in India and subsequently preventing an increase in India's domestic copper scrap recycling rate.

This is concerning as domestic use of copper scrap can act as a compliment to primary copper production and create a circular economy in the copper sector. Scrap standards have been implemented in China, the

[3]Copper Cathodes, copper rods, and copper wires have been treated as refined copper products

EU, Japan and recently have also been proposed by Malaysia. Standards enable us to determine the health of copper scrap stocks which is critical to alleviate concerns regarding quality of copper manufactured from scrap, which is very important for the health & safety with electricity wiring being one of the key usage sector for the copper. The enactment of scrap standards will ensure that good quality scrap generated in India is used as a raw material in the production of copper. It will also promote domestic scrap collection and will reduce dumping of scrap from the West into India.

Opportunity for Indian Economy

Overcoming the hurdles of raw material supply, rising imports, and lack of circular economy can spur a copper boom in India. The potential is there for the taking. India's domestic demand is forecast to increase from 1 million tonnes at present to 4.7 million MT by 2047. Thus, India has the potential to further increase its domestic installed smelting capacity by 2.7 million tonnes by 2047. This expansion could result in the inflow of INR 27,000 crore into the Indian economy. An India with the ability to produce 4.7 million MT of refined copper per annum by 2047 will be the 2nd Largest Producers of Refined Copper in the world. In order to achieve this milestone, India should:

- ***Reduce the MFN duty on the import of copper concentrate and blister copper to 0%***
- ***Expand the ambit of KABIL to include offshore copper mine acquisition***
- ***Review India's FTA with the aim of promoting self-reliance in refined copper***

Note: Inputs & Views are personal of the author (s) and not necessarily of FICCI

Indian Steel – Transitioning to Green Steel

Mr. Gajendra P Singh
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JSW Group

Steel is an indispensable material of the future as it is the major input material required for green-infrastructural development. Direct Decarbonisation of Steel industry will lead to decarbonisation of upstream supply chain of dependent industries such as automotive, RE infrastructure etc. thereby reducing the scope 3 emissions of those industries.

India is the world's 2nd largest steel producing country, producing more than 100 MTPA and the National Steel Policy anticipates that a crude steel capacity of 300 MTPA will be required by 2030-31 to cater to the projected demand. Steel is also a key component of India's energy system. In addition to being an important input to much of its energy infrastructure, the sector itself is a major energy consumer.

The iron and steel sector is responsible for around one-fifth of industrial energy consumption in India, with coal accounting for 85% of its roughly 70 Mtoe of total energy inputs. As a result, the sector is highly emissions intensive, contributing almost a third of direct industrial CO2 emissions, or 10% of the country's total energy system CO2 emissions. Therefore, a significant fraction of global efforts of low carbon steelmaking are to be driven by Indian steel industry.

Technologically, steel industry in India is quite heterogeneous with several process and input material combination and a wide range of different sized facilities in primary and secondary sectors. With advanced technologies, and under the right circumstances, the Indian steel industry could achieve a transformation in the way it makes steel and reduce its environmental impact.

However, this change cannot be an instantaneous shift. The key potential deep decarbonisation technologies are not yet techno-commercially feasible and hence, emissions reductions till 2030 are expected through series of levers like improvement of process and energy efficiency, energy transition to renewable sources, usage of alternative fuel sources, ensuring the use of improved raw material quality, and enhancing material circularity.

With the deployment and optimization of appropriate technologies, it is expected that low-carbon steel-making technologies will become competitive with respect to conventional iron and steel-making technologies. However, additional enablers such as collaboration and engagement across supply chain and encouraging consumers to purchase products that contain low carbon steel would enhance demand of green products and thus shall facilitate quicker switchover to green technologies.

The steel industry will need government support through well-designed policy to help moderate the initial capital costs, as well as the higher opex costs in the transition period that could otherwise render them uncompetitive. It is imperative that several policy initiatives will be essential to help speed up 'low carbon steel' production in the country. There is also a need to have a shared and credible definition of Green Steel or low carbon steel or net zero steel for the country. Green Procurement Policy is also required to create demand for this Green Steel or low carbon steel.

For India the key strategic considerations to achieve decarbonization ambitions are:

- **Defining "Green Steel":** Defining a taxonomy for low carbon emission and near zero carbon emission steel which are acceptable based on Best Available Technologies today. These are related to material efficiency and performance improvements to existing technologies.

- **Developing a market for green steel**: Determine potential lead markets that can be explored to kick-off transformation. The possible options could be through Public procurement, Automotive, Wind energy, Appliances etc. This demand can be further scaled up through near-term and long-term policy instruments. The near-term options that can be explored are CO2 labelling, carbon pricing on end products, producer premiums, consumer premiums, public, self-imposed commitment, carbon contracts for difference mechanism to the use of green steel in all public tender projects.

Hydrogen being the key element surrounding the success of green steel within the country has to be harnessed in a potentially advantageous manner for both the country and the environment. It was welcome move when the Ministry of Power under Government of India launched the Green Hydrogen Policy. There are some key issues surrounding green hydrogen that are listed as follows:

- Lack of manufacturing of equipment related to green steel within the country like electrolyzers, cryogenic cylinders, transportation medium and related infrastructure. Government should create a green hydrogen ecosystem in this direction to keep a tab on the imported equipment and capital goods related to hydrogen, which will also help in maintaining the costs.
- Power / electricity is a major input for the electrolyzers and in the process of making hydrogen. Although Green Hydrogen Policy has outlined certain incentives, reduced rate of GST is also need of the hour to provide affordable power to the hydrogen sector.
- On keeping the financials under control including the initial capital, dedicated green hydrogen energy transmission funds and fiscal incentives such as GST waiver / rebate or a tax holiday for at least 10 years should be extended on setting up such infrastructure.
- Safety is also a prime concern which cannot be negated in the entire scheme of things. As we advance into the new unchartered hydrogen arena, safety standards have to be formed in line with the domestic requirements. International codes and standards can be studied and modified suitably to suit the Indian environment.
- Finally, a dedicated R&D fund, jointly funded by the government and industry, aimed at achieving technological breakthroughs and improving the commercial viability of green Hydrogen should be setup.

Meanwhile, as India leaps into the green steel and hydrogen space, many countries globally have already prepared plans to impose tax to imports of certain goods, which includes steel whose production is carbon intensive. USA and EU have taken the lead to introduce measures, which would calculate the carbon being emitted by other countries in steel making and impose equivalent taxes on the same. Carbon Board Adjustment Mechanism (CBAM) is one such example initiated by EU, which will be in place from October 2023 for collecting global data on emissions and from 2026, based on the data so collected, the taxation would be initiated. India definitely cannot transform its entire steel into green within this period and will eventually have to either lose such foreign markets or sharply increase its production cost being uncompetitive.

Hence, keeping in view the need for decarbonisation in line with the timeframes being set by the global peers, the timelines for India are quite ambitious and the industry and the government have to work together to ensure that the country is not left out in this race.

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Free (but Fair) Trade as an Enabling Factor for Industry

Mr. Abhishek Sinha
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FTAs, while theoretically promoting free trade, often come with hidden non-trade loads imposed by stronger partners in the form of Environment, Labour laws, TBTs, etc. which may not be immediately appropriate or attainable for the weaker partner. So, the trade may be free, but with handicaps placed on one side. India is not just a huge market but also an exporter, so we need more FTAs. At the same time, maximizing Free trade needs minimizing unfair trade. In this article we examine some of the issues and suggestions.

The author was interacting online with the Artificial Intelligence ChatGPT. As part of the conversation, I requested the AI to compose a short poem on the positive impact of trade.

Here's what the AI came up with:

Trade, oh trade, a wondrous thing,
Bringing prosperity, wealth, and joy.
From near and far, it helps us share,
The goods and services we employ.

Trade bridges gaps and builds connections,
Creating friendships, partnerships, and ties.
It fosters growth and innovation,
And helps the world to thrive and rise.

So let us celebrate trade,
And all the good it brings.
For it is a force for good,
That helps the world to spread its wings.

In course of further discussions, I requested the AI to compose a poem from the other side, i.e., the negative impact of trade.

The AI responded with the following composition:

Trade, once a noble exchange
Bringing wealth and cultural range
Now a force that tears and rends
Leaves a trail of broken ends

In its quest for profit and gain
It leaves a trail of human pain
The cost of progress, at what cost?

Communities ripped apart
As goods and capital dart
From one nation to the next

Leaving behind a trail of debt

The haves grow rich, the have-nots poor
The balance of power an uneven floor
Trade, once a noble exchange
Now a force that leaves behind such derange

But it does not have to be this way
We can choose a different path to take

Trade can be a source of good
Bringing wealth and brotherhood

Let us strive for balance and fair play
And turn trade back to a noble exchange

Bringing prosperity and cultural range
Leaving a positive impact in its wake

Trade is a double-edged tool, to be wielded with due precautions.

The two contrasting poems, both generated by the same AI demonstrate the fact that trade is not a panacea for all ills. Yes, trade is an effective tool for promoting growth, but ultimately it is just a tool. Any tool, if wielded without due precautions, can lead to self-injury.

The steel industry in particular has seen both sides of the trade question. When demand collapsed during the tragic nCovid outbreak, steel mills had to keep their plants running- not just because of the continuous nature of the process, but also in order to keep the integrated Oxygen Plants running and keep the nation supplied with the Liquid Oxygen required.

In this critical time, trade enabled the industry to export the surplus steel to other countries and salvage the operations to some extent.

On the other hand, during the calendar years 2015 and 2016, India had seen steel companies bleed all over their balance sheets as low-priced imports slashed away at their bottom line. More recently, we are seeing surge in imports from nations affected by the European conflict and trying to liquidate stocks.

How much free trade is too much? Does free trade truly exist?

There is no denying that “free” trade has enabled many countries to bootstrap themselves towards prosperity.

<u>On the other hand, we have the example of Nauru.</u>

For a time, citizens of Nauru were among the richest in the world, from proceeds of phosphate extraction carried out in the island by developed countries. In 1980, per capita GDP of Nauru was US$ 5,407. (For comparison, Indian GDP per capita in 1980 was US$ 266, while the World Average was at US$ 2,557).

Today, the Phosphate is exhausted. Rampant stripping of topsoil has left nearly 90% of the country a wasteland, unfit for any use, leave alone agriculture. The heat generated from the barren land drives away rain clouds. The once green tropical island today faces continuous droughts and cannot generate enough food for itself. Income comes from internment camps set up by Australia to isolate refugees seeking asylum in Australia. With slowdown in this activity, this income is also dwindling. Long term sustainability of the island country is threatened. Contributions from Australia, Taiwan and China help to maintain the economy.

<u>Consider, also, the impact of Carbon barriers being erected by developed blocs.</u>

54% of Mozambique's aluminium is exported to the EU. It is estimated that post CBAM, cost of Aluminium

exports shall go up by 39% and reduce Mozambican GDP by about 1.6-2%.

Consider, also, that UNCTAD studies indicate decline in developing countries income from carbon Taxes

UNCTAD studies indicate that with a US$ 44 per ton carbon tax, developed country income would rise by US$ 2.5 billion while incomes in developing countries would fall by US$ 5.9 billion. Today's carbon price in EU is about US$ 90 per ton.

Consider, also, the Multilateral process for Decarbonization being ignored at whim of developed countries

There is already a multilateral process extant for reduction of carbon footprint, via the COP process, where countries have assessed their respective capabilities for committing carbon reduction / net zero.

However, in unilateral defiance of the multilateral COP process, certain developed economic blocs are enforcing an acceleration beyond the COP commitments on weaker partners, unmindful of the negative impact on struggling economies. In effect, through CBAM and other proposed measures, developing countries are being asked to compensate decarbonization costs of developed countries.

It is worth noting here that average emission per capita in Africa is about 1 ton and in India is about 1.7 tons. For comparison, EU stands at about 7 tons. i.e., even today, in one month the average EU citizen is responsible for more emissions than an average African could manage in seven months.

This is not to deny the urgency of decarbonization, but a reflection that a cure has to be applied in such a way that it does not itself become worse than the disease. Diversion of funds away from medicine, drinking water, infrastructure, etc. can scant be afforded by developing countries.

Consider, similarly that export of Ferrous scrap from EU to India, Pakistan and Bangladesh will soon be restricted

A vote passed in the Environmental committee of the EU parliament indicates that Ferrous Scrap exports will only be allowed to *"those non-OECD countries that give their consent for audit and demonstrate their ability to treat this waste sustainably"*.

While the stated goals are lofty, the final results shall be more practical – reserving ferrous scrap for use of the domestic European industry, which shall help reduce their decarbonization costs. Ironically, at the same time, India's export duty on iron ore is termed market distorting.

Similarly, developed nations, when negotiating Free Trade Agreements, try to impose their own non-trade standards such as Environment, Labour laws, Gender Equality, etc. on weaker countries.

While there is no denying the need for continuous improvement in these social goals, standards appropriate today in developed nations may not be practical or immediately attainable by a developing country.

There is a common thread running through all the above examples. In each case, a partner with economic clout and advanced socio-economic indicators seeks to impose its terms of trade on weaker partners, who are unable to resist on account of weaker economy, financial or strategic dependence, or lack of technical or financial skill.

The result is that while trade is theoretically free, additional hampering factors get imposed in form of Technical Barriers to Trade such as end to end documentation requirement (next to impossible in developing countries with unorganized industries), labour standards, gender equality requirements, etc. The weaker partner starts batting with handicaps indirectly imposed on it. Thus, the trade is really not truly free, nor truly fair.

The Indian government is strongly articulating its positions in WTO, bilateral and multilateral forums

We are not just a huge market. We are also a potential export powerhouse. What is the way forward?

In order to grow, the country needs to expand its trade. We need to access other markets. The government's vision and approach of quickly tying up Free Trade Agreements is worthy of appreciation.

The in-depth stake holder consultations on FTAs and all other issues that the government now conducts, and the receptivity of the government to the industry feedback has given confidence to the industry that its views are being taken into account in FTAs - whether it be rules of origin, exclusions, opening up time frames for HS codes, or other matters.

Indian government is already articulating its views strongly at multilateral and bilateral forums. We are confident that the assertiveness of the Government shall result in improvement of WTO practices, and also FTAs which are more balanced, sensitive to domestic concerns and will open up more markets to Indian industry.

Maximizing Free Trade needs Minimizing of Unfair Trade

Indian industry is all for Free Trade, but along with it would also like to ensure Fair trade. Truly Free trade can only occur if unfair trade is immediately, effectively and strongly discouraged.

After all, one is less likely to break into a shop if a policeman is watching you with a big stick!

By the same logic, the presence of the policeman and his big stick reduces risk for shop owners and encourages them to stock and trade more from the shop.

Accordingly, while industry welcomes the signing of more FTAs, a commensurate tightening of the measures taken to deter unfair trade practices is also necessary.

One suggestion that could fundamentally improve our Trade remedial practice is offered for immediate consideration and consultation:

Removal of the Lesser Duty Rule: this rule limits corrective duty (anti-dumping / countervailing) to the lower of Dumping margin and Injury margin.

This limits the duty's effectiveness. It also limits the duty's deterrent potential in discouraging other exporters from repeating the same error.

The rule is not mandatory as per WTO rules. While a rationale may have existed in the past for us to apply this rule, it is time to respond to changing circumstances. After all, many countries, including the USA, do not apply this rule.

Partial Review of duty: duties imposed in India get frozen for 5 years, irrespective of subsequent changes in raw material prices, market conditions, etc.

Thus, it is possible, and has already happened in case of steel industry, that a duty imposed after due process of law became irrelevant in few months on account of volatile raw material prices. In order to maintain relevance and effectiveness of duty, **a provision of partial review of duty needs to be explored**, in terms of review only of form of duty, review of dumping margin, etc.

These suggestions shall help to make our trade remedial measures more effective, responsive and of continuing relevance.

A more effective Trade remedial regime and practices facilitate businesses in making the long term investment decisions that industries like steel require. Steelmaking assets look at an operational life of 30-40 years and any risk that can be mitigated, helps the investment decisions.

This is also of prime importance because India's development will only be sustainable on back of sufficient domestic steel capacity and capability.

Note: Inputs & Views are personal of the author (s) and not necessarily of FICCI

Potash: New Investment Opportunity

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Potassium is the seventh most abundant element in earth crust and sixth most abundant elements in seawater, however, its economic extraction is limited. The term “potash” is used for ores mined or chemically manufactured salts containing the element potassium (K). Potassium is one of the major nutrients to increase crop yield, crop quality and plant health. In nature, it occurs in the form of Polyhalites, Sylvites, and Glauconite. Apart from its use in agriculture sector, it is also used in small quantity in glass and chemical industry. Potassium Chloride (KCl) accounts for most of the potash used in world agriculture including India. Other widely used potassium products are potassium sulfate, potassium nitrate, and potassium-magnesium salts.

Unfortunately, India does not have economically viable potash deposits so far, small quantity of potash is produced as by -product from the salt manufacturing in Gujarat. In the absence of potash deposits, country is heavily dependent on the import to meet the demand.

At the time of independence, it was assumed that the Indian soils are potash sufficient but in due course, research has established that Indian soils are deficient in potassium and this deficiency is increasing and affecting the agri-produce. In the light of such situation the Government of India is also taking steps to boost exploration and exploitation strategies to identify workable deposits of potash.

The Principal Source

There are mainly three sources of potash

i. Evaporites in the form of Sylvite (KCl) / Sylvinite (KCI.NaCl), a mixture of sylvite (KCl) and halite (NaCl
ii. Brine water and Britten
iii. Glauconitic sandstone

Evaporite Deposits: Evaporites type potash occurrences are reported in the Nagaur-Ganganagar basin in Nagaur, Bikaner and Ganganagar districts of Rajasthan. The 'evaporites' is geological term used for sediments deposited from marine and non-marine water. These are deep seated deposits that occur between depth range of 500-1000m below surface. World over evaporite deposits are one of the major source of potassium supply.

Brine Water and Bitterns Deposits: The Sea water brine / bitterns (residual brine) are major source of common salt, the sea water contains many minerals including potassium in the form of KCL. The potassium salt along with associated magnesium salts are obtained from the mixed salt from the bitterns of evaporating salt pans. This is achieved through solar evaporation. The bittern is the left-over solution of brine after evaporation and crystallization of sodium chloride. It contains calcium, magnesium and potassium chlorides, sulphates, and other chemicals. Potassium chloride is extracted by thermal dissolution and crystallization process. In countries like Australia, Israel potassium is extracted through this method, but despite long coastline spread through various states in India, due to the small land holdings of salt pans, absence of advance technology, poor R&D work, the potential of extracting potassium from the sea water brine / bitterns is untapped and need attention.

Glauconitic Sandstone Deposits: These are green colour sandstone, geologically referred to as 'glauconite sandstone'. These sandstones contain good amount of potassium. Chemically, glauconite is a hydrous silicate of iron and potassium with variable quantities of aluminium and magnesium. It contains 2 to 8% K_2O. Since marine potash is easily available in the world, hence, little attention is paid to use glauconitic sandstone as a source to extract potash. Recently more efforts are being made to use glauconitic sandstone as a source to manufacture potash to reduce import and achieve self-sufficiency in potash inventory. In India, the occurrences of glauconitic sandstone are reported from many states like Rajasthan, Madhya Pradesh, Uttar Pradesh, Bihar, Andhra Pradesh, Tamilnadu and Kerala. Some of the important localities of glauconite sandstone are Sidhi district in Madhya Pradesh, Sonbhadra district in Uttar Pradesh, Kaimur district in Bihar and Sawai Madhopur and Karauli districts in Rajasthan. These glauconite sandstone occurrences belong to the Vindhyan Super Group or equivalent rocks. Apart from this, glauconitic sandstone also occurs below the lignite seams in Rajasthan and Gujarat at Tertiary and Cretaceous age rocks contact zone. Such occurrences also require attention for investigation.

Mining Technology

The most common mining technology for the deep-seated potassium deposits is solution mining where hot fluid is injected through shafts within ore body to dissolve the salts and recovering them through pumping at surface for refining. The shallow deposits i.e. glauconitic sandstone can be worked with open cast mining methods. The potassium from salt brines and bitterns extracted by evaporation, thermal dissolution and crystallization process.

Mineability of Potassium Deposits in India

In India, potassium mineral exploration is in infant stage and only recently some attention is being given. As per the data available from the Indian Mineral Year Book 2020, India does not have proved reserves of potash. Total indicated and inferred resources of potash are 22,508 million ton. To convert these resources into reserves, extensive exploration drive is required. Recently Uttar Pradesh Government has invited bids for composite license of glauconite. More such efforts are required to unearth extractable potassium deposits.

Feasibility Studies

Joint efforts are underway between Mineral Exploration Corporation Limited (MECL), Rajasthan State Mines & Minerals Limited (RSMML) and the Department of Mines & Geology (DMG), Government of Rajasthan for taking up feasibility studies of Solution Mining of Potash in the state of Rajasthan. The results of these studies, if fruitful, will invite good investments and make India Atmanirbhar in the potash minerals.

There is need of much more attention and efforts of researchers, explorers, investors and government institutions to convert potassium occurrences into workable deposits. This will not only reduce import but generate new source of employment.

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Skilling in Ferrous and Non-Ferrous Sector

Mr. Sushim Banerjee
Chief Executive Officer
Indian Iron & Steel Sector Skill Council

Background

India is today one of the youngest nations in the world with more than 62% of the population in the working age group (15-59years) and more than 54% of the total population below 25 years of age. The opportunity to reap the benefits of "demographic dividend" has to be utilized only with the skilled workforce. Evidently, apart from meeting its own demand, India has the potential to become the worldwide hub for outsourcing skilled manpower. Major section of the workforce is not directly employable, but trainable. Therefore, the role of skill development becomes critical in enhancing employment opportunities and addressing the demand supply gap. Industry has a specific demand suiting to each of the functional areas in the plant. In order to address this, theoretical knowledge needs to be supplemented by practical training.

An earlier study by IIT Kanpur on technical manpower requirement by Iron and steel sector in the country shows there is no supply demand mismatch between the industry demand and the supply of engineering candidates from ITIs, Diploma and Degree colleges and post graduate Institutions. However, there is a big gap in what the industry needs in terms of skilled candidates and the current availability. The skilling activities by the various wings of the Government, private corporate sector and innumerable training institutes, despite their tremendous efforts, have not yet made an appreciable and cohesive impact on bridging this gap. Needless to say, the aspirational aspects for skill training did not receive adequate attention primarily due to lack of planning to institute a structured module for skill development.

The setting up of National Skill Development Corporation (NSDC) in 2009 paved the way for focusing a sectoral approach to skilling as it was perceived that each sector of Indian economy has its own periphery of skilling which is distinctly different from each other, although it is possible to bring in a standardized model with guidelines and specifications that would encompass the uniqueness of each sector and enable to harmonise the total skilling activities in the country. The setting up of a separate wing in the Government, the Ministry of Skill Development and Entrepreneurship (MSDE) in 2015 indicates the significance and role of skilling in economic development of the country.

A typical Iron and Steel plant broadly contains occupation mapping in terms of

- Raw material Handling
- Sintering Plant
- Coke Oven
- Iron making
- Steel making
- Rolling Mills: Hot rolling and Cold Rolling
- Electrical Maintenance
- Mechanical Maintenance
- Instrumentation
- Quality Assurance

In each of these areas a set of skills is needed to perform jobs specific to the operation. It is necessary to develop Qualification Package (QP) through various National Occupational Standards (NOS) for all the critical and major functional areas and arranging training, assessment and certification and placement.

The Indian Iron & Steel Sector Skill Council (IISSSC)

It is an industry (Iron & Steel, Rerolling, Sponge Iron units, Ferro Alloys, Foundries, Steel Construction and Welding) driven non-profit company limited by Guarantee, registered under the Indian Companies Act, 1956. All the major steel companies, SAIL, TSL, RINL, JSW, JSPL, AM/NS, JSL, Arjas Steel, Midhani, NMDC represented by Chairman / Director (HR) and Associations of Sponge Iron, Rerollers, Ferro Alloys, Foundries, Indian Institute of Welding represented by the Secretaries of the Associations are members in the Board of IISSSC. The company is mandated under NSDC and MSDE to develop the occupation specific Job Roles (like Raw Material Handling, Sintering, Coke Ovens, Iron and Steel Making, HR/CR rolling mills, Quality and Assurance, Instrumentation, Quality Assurance, Safety etc) and impart short term skill training, assessment and certification of the candidates. The responsibility of placement of the certified candidates in various industries has also been added as a part of training cycle. The training also enables the employees to map their competence level aligned with National Skill Qualification Framework (NSQF)levels.

<u>The functions of the Sector Skill Council are as under:</u>

- Refine the existing curricula to align it with NOS, obtain approval from an industry led body of experts and facilitate building of delivery capacity. The primary objective of IISSSC is to develop Qualification Packs (QP) according to the industry demand
- Conducting the Skill Gap Study
- Plan and institutionalize an effective system for training of trainers and training of the Assessors.
- Steer the affiliation processes to enable quality assurance in training in par with international standards

- Promote academies of excellence by nurturing state of vocational training
- Create an assessment framework to award tamper proof certification to trainees

IISSSC Activities

IISSSC conduct skill training activities for the entry level positions like Fitter-Electrician, Fitter-Electronics, Fitter-Hydraulics and Pneumatic, Bearing Maintenance, Machinist, Welder etc. Accordingly, IISSSC has developed 60 Qualification Packs (QPs) for various Job Roles for the Iron and Steel Industries in line with National Skill Qualification Framework, out of which 49 Job Roles are approved by NSDC and 11 related job roles are adopted from other councils. Presently training is imparted for 27 Job Roles and IISSSC is in the process of developing further 13 Job Roles with focus on aligning the QPs with Industry 4.0.

For the last 5 years, IISSSC has conducted STT programmes covering 81,000 number of candidates. Initially the placement ratio was poor at around 8-10 per cent and this level has currently reached around 59 per cent of the certified candidates.

Skill Gap Study

The Skill Gap study conducted by IISSSC through National Institute for Secondary Steel Technology (NISST) highlights that there is a need to skill and upskill more than 10.5 lakhs and 8.13 lakhs of candidates In Iron and Steel sector between now and 2030-31. To address this gap the skill development initiatives are being implemented under "The Skill India Mission" anchored by MSDE. It aims to ensure a steady supply of well-trained, highly skilled workforce to meet the manpower requirements of our growing economy. The study has duly considered the impact of circular economy leading to higher manpower productivity and other technological intervention that would require different skill sets in the coming years.

Conclusion

Recently MSDE issued a notification by which IISSSC would also undertake skill development activities in Non-Ferrous sector, namely, Aluminium, Copper, Bauxite, Zinc and Lead. These sets of skilling emerge in the post raw material handling scenario and starts with the processing of the Ore through smelting and other operations.

The large companies like NALCO, Hindalco, Hindustan Copper Ltd, Hindustan Zinc Ltd, Vedanta Group have already been approached. It may be mentioned here that Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur has already signed a MOU with IISSSC to help and support the Skill Gap study and other skill related activities in the Non-ferrous sector.

India's efforts for skill development for millions of its workmen would prove its effectiveness and worth in reduction of unemployment rate by encouraging industry and service sectors to enhance placement of skill trained people in the coming years.

Note: Inputs & Views are personal of the author (s) and not necessarily of FICCI

Key Enabling Factors for Mining, Metals and Cement Industry

Mr. K K Agarwal
Chairman and Managing Director
CJ Darcl Logistics

India is seeing a phenomenal rise in infrastructure development and automotive production leading to growth in demand for the metals, mining, and cement industry in India. The Government of India through the Union Budget has also been incentivising and providing policy support to both - infrastructure development and metals, mining, and cement industry.

The Growth Potential for Mining, Metals and Cement Industry

As of FY22, the number of reporting mines in India were estimated at 1,425, of which reporting mines for metallic minerals were estimated at 525 and non-metallic minerals at 720. The major mining states in India are Andhra Pradesh, Jharkhand, Orissa, Rajasthan, Karnataka, Madhya Pradesh, Chhattisgarh and Maharashtra. According to the Indian Bureau of Mines (IBM) preliminary statistics, the total growth from April-July 2022–23 over the same time in the previous year increased by 6.1%. India became the 2nd largest producer of aluminium in the world in FY21 while India is the world's second-largest coal producer, steel producer and cement producer.

The Government of India has also launched key policy initiatives. The National Mineral Policy, launched in February 2019, has ensured improved regulation and enforcement, better transparency, balanced social and economic growth, and sustainable mining techniques. The policy grants industry status to the mining activities and boost private sector funding. The policy also enables the facilitation of merger and acquisition of mining companies, enticement of private sector involving exploration, and permit to the transfer of mineral corridors created specifically for metals and mining leases. The government is also exploring ways to accelerate exports in this sector.

While cement, coal, steel, aluminium, have seen an increase in demand due to various factors, copper is expected to remain high in demand. Decarbonization of metals like nickel, cobalt, and lithium used as raw materials for rechargeable batteries are also seeing a spurt in demand. The green transition is increasing the demand for metals and minerals that are needed to produce wind turbines, solar panels, electric vehicles, battery storage, and other electronic equipment. Metals such as copper, lithium, and vanadium, are central to green technologies and energy generation and storage.

Operational Risks and Way Forward for the Metals, Mining and Cement Industry

Given the huge growth trajectory, this industry must ensure that operations are run more efficiently. There are frequent breakdowns leading to downtime risk. Challenges are at every stage of the production process, from raw materials sourcing to operations, and energy management, finished product quality. Therefore, to dissolve these supply chain gaps, CJ Darcl owns or leases, a fleet of tip trailers that are dedicated to particular mining zone where they pick up the iron ores from the mines and source it to the market or other destinations increasing the operational efficiency in the logistics industry.

Given the nature of work, EHS (Environment, Health, and Safety) is paramount. Emerging regulations pertaining to Green House Gas (GHG) emissions, carbon tax and ESG (Environmental, Social, and Governance) are also adding to the operational challenges. Technology and digitalisation are being imbibed by most large producers across operations, from improving operational efficiencies to driving strategic data-driven decision-making. Integrated demand planning tools, sales force automation and e-supplier platforms are also some to the technology being implemented. This sector is characterised with physical risks to manpower involved in the manual extraction. Technology and automation like satellite communication, IoT, automated truck hauls etc. are being used to make the process safer. Use of drones for real time asset monitoring and inventory count is also becoming popular. It helps in reducing the time and labour that goes in monitoring while significantly increases the accuracy levels.

Embracing new-age technologies in an integrated manner across the value chain can unlock managing variability, enhancing productivity, optimising resources, and delivering sustainable savings in better ways. Companies need to bridge the gap between strategy and execution to create the 'Intelligent Mines and the Plants of the future'.

Supply Chain and Logistics in the Metals, Mining and Cement Industry

The industry is also facing many challenges in supply chain and logistics due to inadequate infrastructure and visibility. The industry is in remote locations close to the mines and quarries, leading to additional freight costs. Companies need to intensify their efforts to boost efficiency, resiliency, and transparency in their supply chains. Demand variability, persistent supply constraints, and the price volatility continuously impacting supply chains. Companies need to be agile to quickly scale up and deliver when the demand is high and then could just as quickly scale back when the demand is low. Connecting the mine to market means the movement, storage and blending of materials across the mine. Because of this interconnectivity, any stoppage throughout the material handling chain will have negative impacts on productivity and profits. This is one industry where the logistics is most challenging, requires more complex logistic operations involving any combination of road, rail, barge and coastal or deep-sea freight. Specialised heavy

equipment and handling facilities, safety standards to handle and move the freight and planning and operations teams are pre-requisites to movement of cargo in the metals, mining, and cement industry.

Despite these challenges, CJ Darcl looks forward to coping up with its advance specialization of containers to avoid damage, breakage, and spoilage. To ease the movement of cargoes, it facilitates its clients with the infusion of 42' containers which enables to carry long products like Pipes, Bars etc. Dwarf containers to make cost effective rail solution for light weight cargo, Top Openable containers for glass product movement and other specialized containers – 22'/ 24'/ 25' etc. as per client's cargo suitability. For warehousing and storage, CJ Darcl Logistics offers multi-user warehousing facility by assigning dedicated freight corridors (DFC) to its clients therefore enhances its operations making them cost-effective and in achieving real-time deliveries therefore eliminating the voids in supply chain management.

Logistics control tower solution offers traceability and visibility across the supply chain including performance monitoring of transportation partners and it also reduces the turnaround time. It can bring greater visibility across the entire organisation—from raw materials and supplier inventories to customer orders, production status, transportation (inbound, outbound, and inter-company) and supply chain logistics. A control tower can also perceive and respond to critical situations such as equipment failure, inventory shortages, transportation issues or manpower issues. CJ Darcl Logistics for better transparency uses technology like SAP and TMS for keeping the track of the real-time movement of the cargoes.

The mining, metals and cement industry is in the spotlight as the world's supply chains look to meet rising demands. The challenge is to quickly deliver the materials as per the demand to the clients in a sustainable manner, with transparency and high-quality engagement.

CJ Darcl Logistics is a leading logistic player that has grown its pan India network by offering multimodal connectivity through road, rail, coastal and air. With its continuous expansion, CJ Darcl aims to be the leading Total Logistics Service provider by the year 2027.

Note: Inputs & Views are personal of the author (s) and not necessarily of FICCI

Domestic
&
International News

Domestic News

JSL Lifestyle bets on railway coach business to double its top line

Last Updated: Jul 16, 2022, 12:23 AM IST

Source:https://economictimes.indiatimes.com/industry/indl-goods/svs/steel/jsl-lifestyle-bets-on-railway-coach-business-to-double-its-top-line/articleshow/92907877.cms

JSW Steel crude steel output grows 14 pc to 15.69 LT in July

PTI • Last Updated: Aug 09, 2022, 12:21 PM IST

Source: https://economictimes.indiatimes.com/industry/indl-goods/svs/steel/jsw-steel-crude-steel-output-grows-14-pc-to-15-69-lt-in-jul/articleshow/93448041.cms

JSW Steel ropes in BCG to work on decarbonisation goals

PTI • Last Updated: Jul 18, 2022, 12:08 PM IST

Source: https://economictimes.indiatimes.com/industry/indl-goods/svs/steel/jsw-steel-ropes-in-bcg-to-work-on-decarbonisation-goals/articleshow/92949600.cms

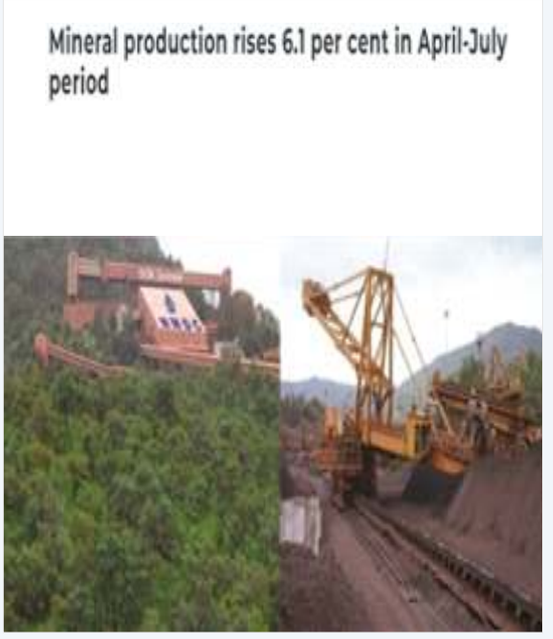
India's cement sector to add 80-100 mt capacity by FY25: K M Birla

Last Updated at July 25, 2022 22:42 IST

Source: https://www.business-standard.com/article/companies/india-s-cement-sector-to-add-80-100-mt-capacity-by-fy25-k-m-birla-122072501378_1.html

Source: https://www.business-standard.com/article/current-affairs/odisha-to-set-up-12-steel-plants-with-capacity-of-60-mt-per-annum-minister-122072501239_1.html

Source: https://economictimes.indiatimes.com/industry/indl-goods/svs/steel/steel-makers-margins-to-nearly-double-in-h2-to-25-pc-from-h1-levels-report/articleshow/94079497.cms



Source: https://www.aninews.in/news/business/mineral-production-rises-61-per-cent-in-april-july-period20220921183553/

Source: https://www.psuconnect.in/news/ceo-speak-at-6th-national-conclave-on-mines-minerals/33382/

Tata Steel to invest Rs 12,000 cr in FY23 on India, Europe operations: CEO Narendran

Last Updated: Jul 17, 2022, 01:44 PM IST

Source: https://economictimes.indiatimes.com/industry/indl-goods/svs/steel/tata-steel-to-invest-rs-12000-cr-in-fy23-on-india-europe-operations-ceo-narendran/articleshow/92933937.cms

How is India planning to decarbonise the steel industry

Last Updated: Jul 07, 2022, 03:12 PM IST

Source: https://economictimes.indiatimes.com/small-biz/sme-sector/how-is-india-planning-to-decarbonise-the-steel-industry/articleshow/92644296.cms

Pralhad Joshi addressed conference on Indian mineral and metal industry

BY PSU CONNECT - DATE: 23-08-22

Source: https://www.psuconnect.in/news/pralhad-joshi-addressed-conference-on-indian-mineral-and-metal-industry/33981/

India to double steel production in eight years to 240 MT: Union Steel Minister Jyotiraditya Scindia

PTI • Last Updated: Jul 08, 2022, 11:10 PM IST

Source: https://economictimes.indiatimes.com/industry/indl-goods/svs/steel/india-to-double-steel-production-in-eight-years-to-240-mt-union-steel-minister-jyotiraditya-scindia/articleshow/92756063.cms

Tata Steel to roll out 'First in India' seating system for Vande Bharat; to spend Rs 3k cr on R&D

Last Updated: Jul 31, 2022, 02:14 PM IST

Source: https://economictimes.indiatimes.com/industry/indl-goods/svs/steel/tata-steel-to-roll-out-first-in-india-seating-system-for-vande-bharat-to-spend-rs-3k-cr-on-rd/articleshow/93249800.cms

AM/NS India to expand hot-rolling capacity at Hazira

Published date: 28 September 2022

Steel manufacturer ArcelorMittal Nippon Steel (AM/NS) India plans a 6mn t/yr capacity expansion of its upstream and hot-rolling facilities at Hazira plant in Gujarat.

The company aims to build two blast furnaces, two sintering facilities and three coke furnaces for the ironmaking process at Hazira, and plans to make three basic oxygen furnaces, two continuous casting machines for steelmaking and one hot strip mill by utilising the unused land at the plant.

Source: https://www.argusmedia.com/en/news/2375192-amns-india-to-expand-hotrolling-capacity-at-hazira?backToResults=true&selectedMarket=Metals

Indian JSW Steel partners SMS Group for decarbonisation

Published date: 14 September 2022

Indian private-sector steelmaker JSW Steel has signed an initial deal with German technology company SMS Group to reduce carbon emissions and produce green steel.

SMS Group will provide technology expertise, design, engineering consultancy and commissioning for executing decarbonisation projects across JSW Steel plants in India, while the steelmaker will provide raw materials, consumables and manpower for the project.

Source: https://www.argusmedia.com/en/news/2370682-indian-jsw-steel-partners-sms-group-for-decarbonisation?backToResults=true&selectedMarket=Metals

Shree Cement 'very bullish', setting up new factories: MD Bangur

Last Updated at August 9, 2022 19:21 IST

Source: https://www.business-standard.com/article/companies/shree-cement-very-bullish-setting-up-new-factories-ceo-bangur-122080900633_1.html

Metal sector needs to be at forefront of circular economy model: Jyotiraditya M Scindia

Last Updated: Aug 26, 2022, 05:31 PM IST

Source:
https://economictimes.indiatimes.com/industry/indl-goods/svs/metals-mining/metal-sector-needs-to-be-at-forefront-of-circular-economy-model-jyotiraditya-m-scindia/articleshow/93801829.cms

India seeks to mandate low-grade iron ore beneficiation

Published date: 17 August 2022

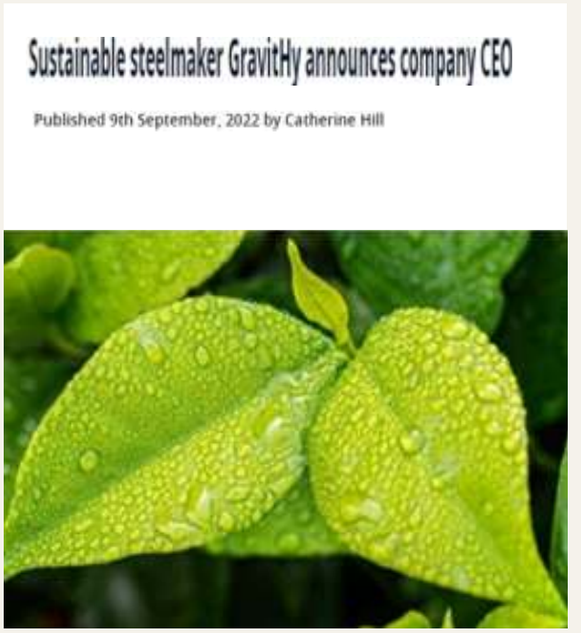
The Indian government's ministry of mines is consulting with the mining industry as it pushes for mandatory beneficiation of low-grade iron ore.

The ministry, in a bid to ensure utilisation of low- and lean-grade iron ore resources, wants to mandate 80pc of total iron ore produced in a year by a mining leaseholder that is below 58pc Fe to be beneficiated to 62pc Fe and above.

Source:
https://www.argusmedia.com/en/news/2361849-india-seeks-to-mandate-lowgrade-iron-ore-beneficiation?backToResults=true&selectedMarket=Metals

International News

Source: https://www.mining.com/south-star-secures-construction-permit-for-graphite-mine-in-brazil/



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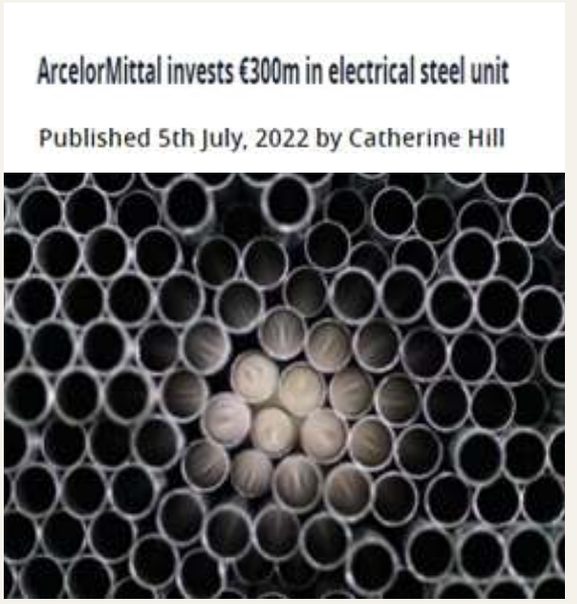
Source: https://www.mining.com/teck-agnico-team-up-at-san-nicolas-copper-project-in-mexico/

Source: https://www.steeltimesint.com/news/nucor-gallatin-produces-first-coil-using-danieli-qsp-technology

Source: https://www.mining.com/web/australia-approves-34-million-in-funding-for-critical-minerals-projects/

Source: https://www.steeltimesint.com/news/h2-green-steel-pairs-with-hitachi-energy-to-build-first-fossil-free-steel-plant



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Source: https://www.steeltimesint.com/news/emirates-steel-arkan-plans-green-iron-supply-chain

Source: https://www.mining.com/tertiary-minerals-fqm-team-up-to-boost-zambian-exploration/

Source: https://www.steeltimesint.com/news/largest-investment-in-green-steel-ever-planned-by-salzgitter

Source: https://www.steeltimesint.com/news/australian-coal-producer-to-invest-169-1m-in-mining-expansion

Events / Webinars / Meetings

6th National Conclave on Mines & Minerals

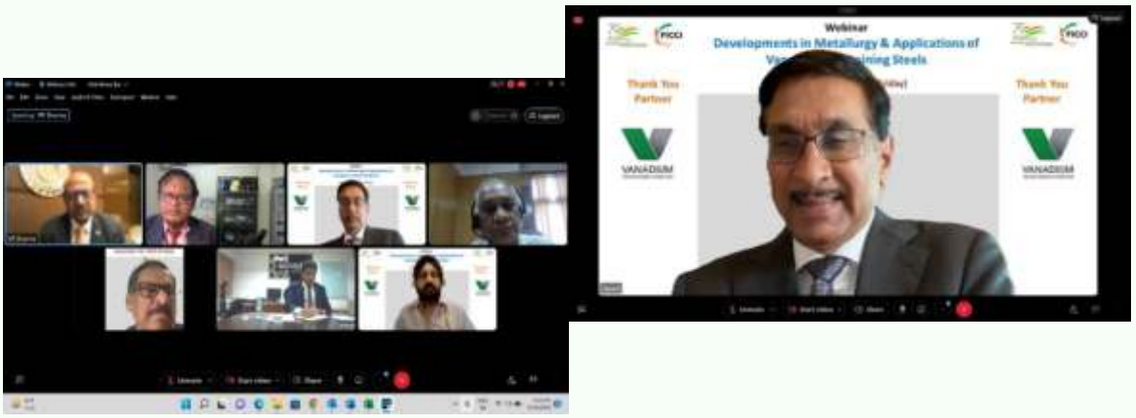
Ministry of Mines, Government of India on the side-lines of the **6th National Conclave on Mines & Minerals,** organized the **CEO Speak** at **Dr. Ambedkar International Centre, New Delhi** on **July 12, 2022 (Tuesday)** with FICCI as the industry partner for the programme. The key objective of the CEO Speak was to provide a platform to the industry to share their vision, opportunities and challenges in the context of Vision 2047 and the National Mission of Atmanirbhar Bharat.

International Conference on Indian Minerals & Metals Industry: Transition Towards 2030 & Vision 2047: August 23-24, 2022

Against the backdrop of "Azadi Ka Amrit Mahotsav", to commemorate 75 glorious years of India's Independence, NMDC Ltd. in collaboration with FICCI organized an International Conference on Indian Minerals & Metals Industry: Transition Towards 2030 & Vision 2047 on August 23-24, 2022, at Hotel Taj Palace, Diplomatic Enclave, New Delhi. The megaevent witnessed participation by eminent personalities – Ministers, Senior Government Officials, Industry Leaders, Business Bodies, Ambassadors, Foreign Dignitaries, and Academicians. The key objective of the event was to have engaging discussions on the roadmap for Indian Minerals & Metals sector's transition towards 2030 & Vision 2047.

Webinar on Developments on Metallurgy & Applications of Vanadium Containing Steels: September 30 (Friday), 2022

FICCI organized a webinar focusing on Metallurgy & Applications of Vanadium containing Steels. The webinar shed light on latest developments, trends, & opportunities in metallurgy and applications of vanadium alloyed steels focusing on the value chain of vanadium usage in steel sector from availability / sourcing, metallurgy R&D, usage across sectors and the regulatory regime.



Meeting of FICCI Mining Committee over Virtual Mode, 21st September 2022

A Meeting of FICCI Mining Committee 2022 was held via Videoconferencing on September 21, 2022. The objective of the Committee Meeting was to update on the action points from the last committee meeting, various FICCI initiatives taken during the last year, discuss members' inputs and identify the key issues to be represented by FICCI, discuss various programmes to be organized in FY 2022-23 and the representations that needs to be taken up with the Government.

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About FICCI

Established in 1927, FICCI is the largest and oldest apex business organization in India. Its history is closely interwoven with India's struggle for independence, its industrialization, and its emergence as one of the most rapidly growing global economies.

A non-government, not-for-profit organization, FICCI is the voice of India's business and industry. From influencing policy to encouraging debate, engaging with policy makers and civil society, FICCI articulates the views and concerns of industry. It serves its members from the Indian private and public corporate sectors and multinational companies, drawing its strength from diverse regional chambers of commerce and industry across states, reaching out to over 2,50,000 companies.

FICCI provides a platform for networking and consensus building within and across sectors and is the first port of call for Indian industry, policy makers and the international business community.