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S C SURI
Editor-in-Chief, IIM-DC Newsletter

Chapter Activities

The meeting of the Executive Committee of Delhi Chapter was held on 25th February 2023. Various issues relating to the Chapter were discussed in the meeting.

Felicitation of Shri S C Suri

Shri S C Suri, Past Chairman of the Chapter was felicitated in the meeting held on 25.2.2023 towards his immense contribution to the cause of IIM in general and growth of Delhi Chapter in particular.

Visuals of Felicitation of Shri S C Suri













Shri S C Suri played a significant role in the biennial flagship event MMMM (Minerals, Metals, Metallurgy and Materials) of our Chapter since 1996.

Shri B D Jethra, Past Chairman, read out the salient points of Shri S C Suri's contribution in the IIM.

During the felicitation function, Shri S C Suri shared reminiscences of his working in Steel Sector & IIM.

Performance of Indian Steel Sector: April 2022 – Jan. 2023

Item	Performance of Indian steel industry		
	April-January 2022-23*(mt)	April-January 2021-22(mt)	% change*
Crude Steel Production	103.545	99.029	4.6
Hot Metal Production	66.824	64.676	3.3
Pig Iron Production	4.896	5.063	-3.3
Sponge Iron Production	35.855	32.698	9.7
Total Finished Steel (alloy/stainless + non-alloy)			
Production	99.480	93.409	6.5
Import	5.000	3.907	28.0
Export	5.329	11.142	-52.2
Consumption	97.100	86.967	11.7
Source: JPC; *provisional; mt=million tonnes			

India's Coal Production Touches 698.25 MT in 10 Months of Fiscal

India's domestic coal production has shown impressive growth during the past few years. Coal production has increased from 730.87 MT (Million Ton) in 2019-20 to 778.19 MT in 2021-22, achieving a growth of 6.47 per cent.

The rising trend of coal production has further gained pace in the current financial year 2022-23 and country's total coal production has recorded an impressive growth of more than 16 per cent with production of 698.25 MT during the period from April'2022 to January'2023 as compared to 601.97 MT during the corresponding period of the previous year.

In this period, production of Coal India Limited (CIL) has also gone up by about 15.23 per cent to 550.93 MT from 478.12 MT. The increase in domestic coal production has helped the country curb import to a large extent in face of sharp increase in coal demand arising due to continuous rise in power consumption.

The Coal Ministry has fixed the target of 1.31 BT (Billion Ton) for FY 25 and the same is to go up to 1.5 BT by FY30. The Ministry has been actively engaging with various State Government and Central Government agencies both for starting new coal mines and also for increasing coal production in the currently operational mines.

Most of Auctioned Coking Coal Mines to Start Production by 2025

Most of the 10 coking coal blocks that have been auctioned to the private sector in the last two years are likely to start production by 2025, according to the Coal Ministry. To augment the output of raw coking coal, a key input in the production of iron and steel, in the country, the ministry has auctioned 10 coking coal blocks to the private sector.

These mines have peak rated capacity (PRC) of 22.5 MT. Domestic raw coking coal production is likely to reach 140 million tonnes (MT) by 2030.

Coal India (CIL) which accounts for over 80 per cent of domestic coal output has planned to increase raw coking coal production from existing mines up to 26 MT and has identified nine new mines with PRC of about 22 MT.

Also, CIL has offered eight discontinued coking coal mines, out of the total 30 discontinued mines, on an innovative model of revenue sharing to the private sector with a PRC of two MT.

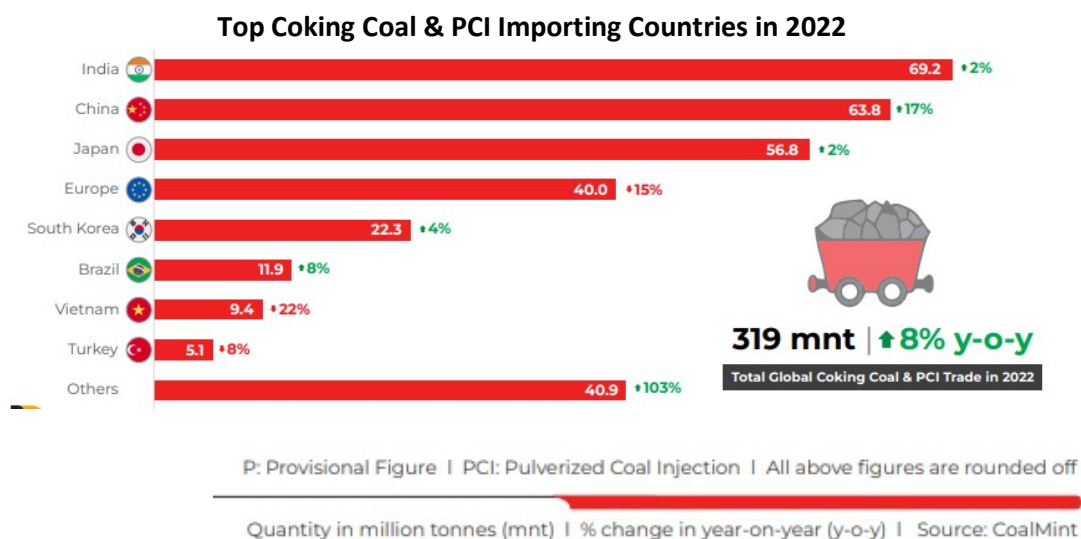
The coal ministry has also identified four coking coal blocks and Central Mine Planning and Design Institute (CMPDI) also will finalise the geological report (GR) for four to six new coking coal blocks in the next two months. These blocks may be offered in the subsequent rounds of auctions for the private sector to further step up domestic raw coking coal supply.

At present, domestic raw coking coal washing capacity is about 23 MT per annum, including 9.26 MT of the private sector. CIL is planning to set up and operationalise nine more new washeries with a capacity of 30 million tonnes per annum (MTPA). With the setting up of new washeries, it is estimated that CIL will be able to supply about 15 MT of washed coking coal to the steel sector, thereby reducing the import of coking coal. During FY2021-22, CIL supplied 1.7 MT washed coking coal to the steel sector and set a target of 3.45 MT during FY2022-23.

Source: Millenium Post, New Delhi, 27th February 2023

Coking Coal and PCI Coal Import Scenario in 2022

Despite the slump in world crude steel production in 2022, global seaborne trade in coking coal remained strong with imports of Coking Coal and PCI Coal increasing by 8% y-o-y to around 319 million tonnes from 295 million tonnes in 2021 (provisional data).








Global Coking Coal and PCI Trade in 2022

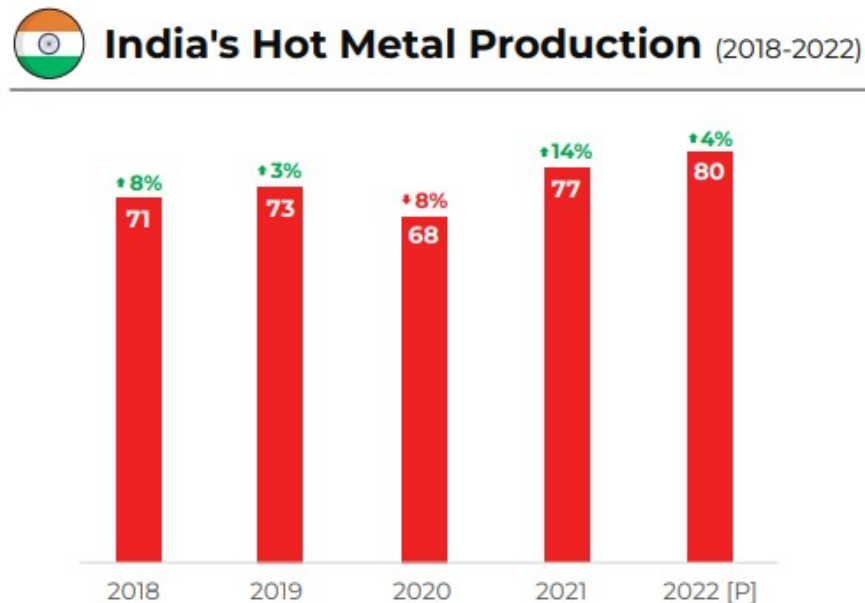
India was the leading coking coal importer at 69 million tonnes, accounting for 22% of total global imports. India's imports were almost stable y-o-y compared to 2021. China was the second-largest importer at 63 million tonnes. Imports by China rose 17% y-o-y, although crude steel production fell around 2%. Imports by Japan and South Korea remained largely stable y-o-y at 57 million tonnes and 22 million tonnes, respectively. Sentiments remained bearish on a gloomy global steel export outlook amid high inflation, supply chain problems in the auto industry and natural disasters. Europe's coking coal imports fell by 15% y-o-y due to high energy inflation affecting steel production and demand following the outbreak of the Russia-Ukraine conflict. After Europe imposed a complete ban on Russian coal imports from 10 August 2022, global trade flows altered. The EU traditionally sourced 55-60% of its coking coal requirement from Russia, and Australian and US coking coal made their way into the continent.

Top Exporters

Australia was the largest coking coal exporter in CY22, although its share in global exports fell by 8% compared to 2021 due to bad weather. The La Nina event in the country led to heavy rains in the mining regions which affected operations, leading to supply disruptions. In addition, strikes by mine workers and unavailability of labour weighed on production. The US and Canada emerged as an alternative to Australian coal due to supply disruptions. Russia emerged as the second largest exporter with 47 million tonnes, an increase of 48% y-o-y. The war between Russia and Ukraine affected seaborne trade dynamics of coking coal. As more Russian coal found its way into China and India, Japan and South Korea reduced sourcing of Russian coal in response to Western sanctions.

Exporting Countries	2022 [P]	2021	% change in year-on-year
India's Country-wise Imports			
 Australia	43.7	54.1	↓19%
 Russia	9.7	3.8	↑154%
 United States	7.0	3.1	↑126%
 Mozambique	2.9	1.7	↑65%
 Indonesia	2.7	1.7	↑63%
Others	3.2	3.7	↓13%
Total	69.2	68.1	↑2%

India's crude steel production increased by around 6% y-o-y to over 124 million tonnes. Similarly, hot metal production also increased by 4% to 80 million tonnes from 77 million tonnes in 2021. For Indian importers of coking coal there was no major change in the demand scenario. Demand remained generally steady.



Global energy inflation drove steam coal prices to record highs across the globe, while steel production in many parts of the world suffered owing to high inflation and currency volatility. So, thermal coal prices soared way above coking coal prices globally forcing thermal coal users to switch to coking coal in many cases. This, in part, contributed to higher coking coal trade volumes.

Outlook

WSA has predicted steel demand to increase by 1% in 2023 to over 1.8 billion tonnes. Steel markets are expected to normalise in 2023, excluding China. Fitch expects global steel consumption to shrink by 60-65 mnt in 2022, with capacity utilisation dropping from 80% to 77%. China's targeted reduction of steel production will account for 20-30 mnt of this, with the rest coming from demand destruction outside China. Incremental growth in steel consumption in 2023 is expected in India, Southeast Asia and the US. Therefore, coking coal demand will remain stable. Coking coal imports by India from Australia are also expected to remain stable in 2023, with the FTA between the countries leading to duty-free inflow of coal.

Source: CoalMint

NMDC Aims for Sustained Growth

NMDC Limited, a large cap company operating in mining sector has attractive fundamental setups due to several factors. To begin with there is robust steel demand in India which will increase due to government's focus on infra development. With the opening up of the China market, there is positive outlook for steel demand. Secondly, there is no export duty for NMDC, which allows the company to sell its products overseas at competitive prices.

Given these reasons, many steel players in India are adding capacity, which is expected to drive up demand for iron ore over the next few years. The removal of export duty on iron ore, pellet, and steel in Nov '22 is already showing positive signs and prices of iron ore have increased since then. Also, global iron ore prices have been rising, on the back of improving China demand. This, would benefit players such as NMDC to supply more in the domestic market as well as look to exports. NMDC has demerged its steel plant, which has now been listed separately. The overhang of the steel plant capex has been done away with, providing more comfort on the core iron ore business.

The capacity expansion is on the cards for NMDC (50MT being increased to 70MT), which would support volumes ahead. Strong domestic demand, exports of iron ore and pellets would be the key demand drivers for NMDC.

Robust domestic demand

India was one of the handful countries whose crude steel production saw an improvement of 5.5% y-o-y to 125 mt in CY22. Most companies have guided for a robust volume growth in Q4FY23. India is all set to double its capacity with all major steel manufacturers undertaking robust capacity expansion to cater to the ever-rising domestic demand. The government's strong push on infrastructure and construction, along with improved demand for auto, is expected to drive the demand for steel, which in turn, will simultaneously boost the demand for iron ore in India. Similarly, higher pellet exports too are expected to drive the demand for iron ore in India.

Roll back of export duty

The government rolled back the export duty on steel, iron ore, and pellets in Nov '22 after a gap of six months. Pellet exports are likely to pick up with the withdrawal of duty and since NMDC is the supplier to numerous pellet manufacturers, we expect it to benefit significantly from the same. Post opening up of the China market, prices in international markets have rallied over \$120/t and NMDC is expected to export a small

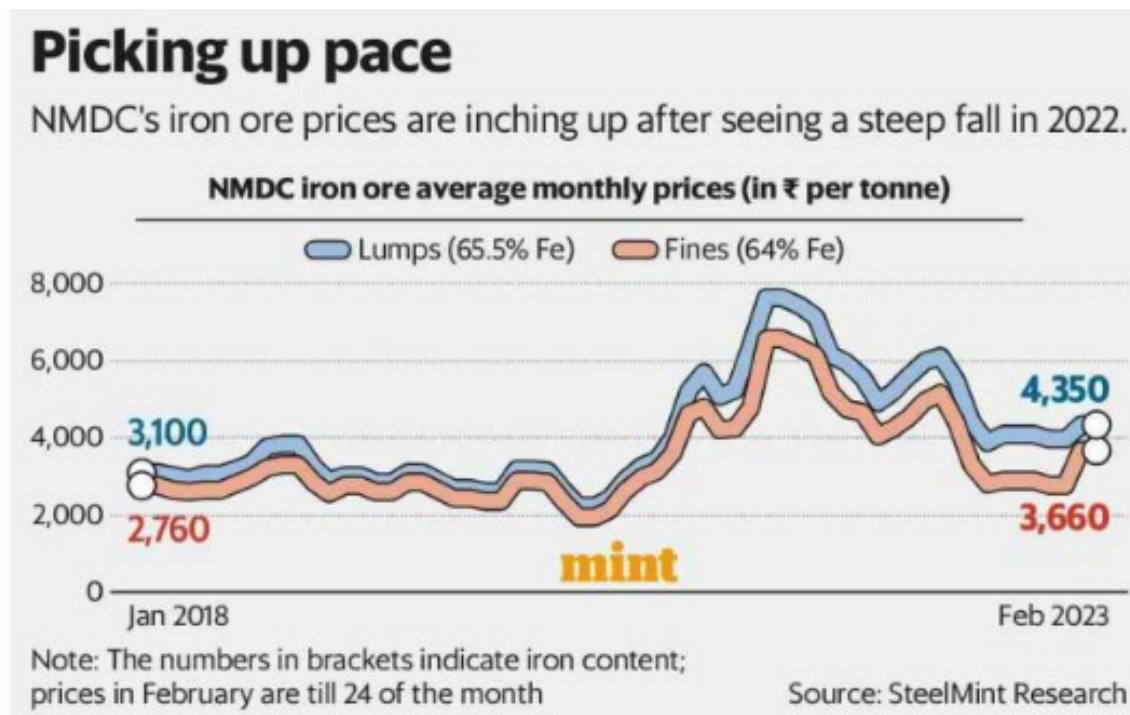
batch by the end of Mar'23. Currently, prices, which are hovering above \$120/t, offers a viable option for the company to undertake exports.

NMDC has also undertaken a capex to set up a 2-mt pellet plant, which is expected to commence production at the end of CY24. This should enhance the product offering and margins for NMDC, going forward.

Set to enhance iron ore capacity

NMDC is undertaking numerous capex programs, which will eventually increase its mining capacity to 70-75 mt from its current 50 mt. NMDC is doubling its railway line capacity and the Jagdalpur line is 75% completed. The capex earmarked for undertaking this expansion stands at Rs 20 bn for FY23 and Rs 15-16 bn for FY24.

Q4 is a stronger quarter with pickup in heavy capex infrastructure and construction activities, which will lead to higher steel consumption, and consequently, drive up iron ore demand. With export of steel and pellets picking up pace and no drag from the steel business, we expect NMDC to continue its volume growth journey.



Source: Financial Express, New Delhi, 27th February 2023

Battery Waste Management Rules 2022

L. Pugazhenth
Executive Director
India Lead Zinc Development Association
&
Past President, The Indian Institute of Metals



For several decades now, India has been using Lead batteries in various applications like automobiles, railways, communication, power, inverters etc. With the advent of the computer era, UPS became another major application for Lead batteries. And now with the emerging markets like renewable energy and e-rickshaws, the usage of Lead batteries has become more widespread and hence tonnage wise, Lead batteries is the largest electrochemical source of energy in India.

In order to ensure an organized collection of Used Lead Acid Batteries (ULABs) and eco-friendly recycling, the **Ministry of Environment & Forests** brought out **Battery Management & Handling Rules (BMHR)** in 2001. These rules covered all stakeholders namely battery manufacturers, dealers, reconditioners, recyclers, consumers (individual as well as bulk), auctioneers, importers of new batteries etc. BMHR had the following battery collection targets:

<i>First year (2002)</i>	<i>50%</i>
<i>Second year (2003)</i>	<i>75%</i>
<i>After second year</i>	<i>90%</i>

Following the Paris Round on Climate Change in 2015, various countries including India, want to contain any increase in global warming and to minimize urban transport pollution load. As a result, India began to launch an Electric Mobility Mission called FAME (Faster Adoption and Manufacturing of Hybrid & Electric Vehicles) with a significant subsidy scheme for both EV manufacturers as well as buyers of EVs. This has given a fillip to electric two wheelers and electric three wheelers using Lithium ion batteries. Electric cars, Electric buses for urban transport have also gained momentum in our country.

There will be more availability of used Lithium ion batteries after a few years. Therefore, the **Ministry of Environment, Forests & Climate Control** (MoEF & CC) wanted to bring in one comprehensive set of rules to cover all types of batteries such as Lead batteries, Lithium ion batteries, Zinc dry cell batteries, Nickel Cadmium batteries, button

cells etc.; this led to the supersession of BMHR and introduction of **Battery Waste Management Rules** (BWMR) in August 2022.

BWMR covers battery manufacturers, dealers, consumers and all entities involved in collection, segregation, transport and recycling. However, BWMR excludes batteries used in Defence & Space Equipment. BWMR covers end of life batteries, rejected batteries, expired batteries, discarded batteries etc.

The main focus of BWMR is fixing the Extended Producer Responsibility (EPR) on battery manufacturers, dealers, consumers and all entities involved in collection, segregation, transport and recycling of used batteries and to send them for green recycling (no land filling, no incineration). These stakeholders are expected to meet collection / recycling / refurbishing targets; these entities should file an EPR Plan to CPCB through an online portal. Registration will be sent followed by an EPR Registration Certificate to the applicants; renewal will be done periodically. The ERP Certificates will carry GST details and can be sold to producers in exchange for waste batteries. An appropriate Buyback / Refund Scheme should be introduced by these entities; they should also file Annual Returns in June following year. Products should carry appropriate warnings, labelling.

Similar responsibilities have been fixed for consumers, public bodies like municipal corporations, used battery collectors / segregators / refurbishers / recyclers etc.

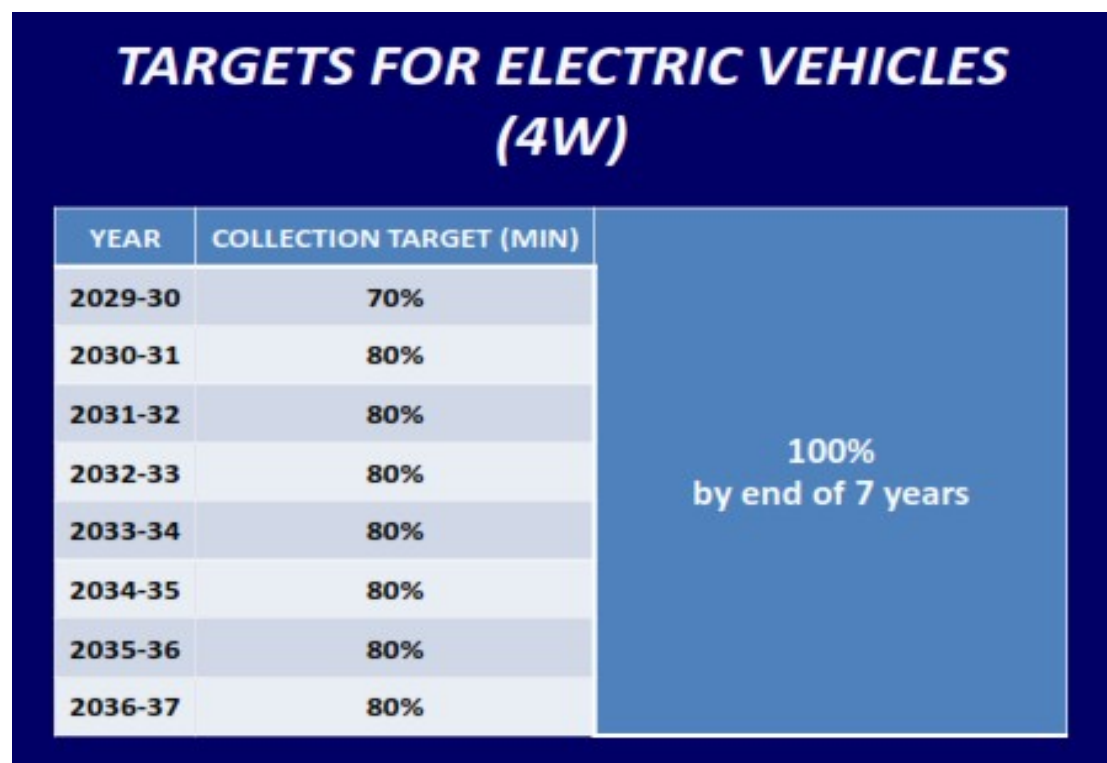
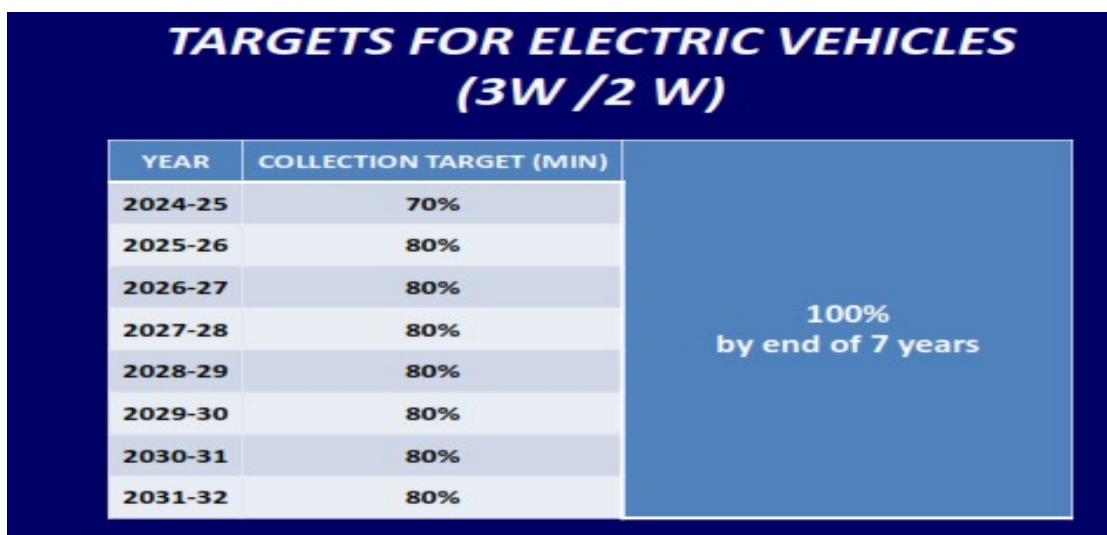
Following Recovery Targets have been fixed for Recyclers:

<u>BATTERIES</u>	<u>2024-25</u>	<u>2025-26</u>	<u>2026-27 & onwards</u>
Automotive	55	60	60
Industrial	55	60	60
Electric Vehicles	70	80	90
Portable	70	80	90

Central Pollution Control Board (CPCB) has been given the main responsibility for effective implementation of BWMR 2022, who will have an online portal for registration purposes; registration for 5 years should be given in two weeks. CPCB will charge a fee

for registration which will be shared with respective SPCBs / SPCCs alongwith ERP details. Such registration can be cancelled or suspended for any violations during the period. CPCB can also order any auditing, inspection or verification by any expert or a committee. CPCB will develop an appropriate mechanism for exchange of ERP Certificates online. CPCB has already formed an Implementation Committee for effective implementation and monitoring of BWMR.

Finally, the BWMR has fixed targets for automobile batteries, industrial batteries, Electric Vehicles (2Ws / 3 Ws) as well as four wheelers EVs (4 Ws) as shown below:



TARGETS FOR AUTOMOBILE BATTERIES

YEAR	COLLECTION TARGET (MIN)	100% by end of 5 years
2022-23	30%	
2023-24	50%	
2024-25	70%	
2025-26	90%	
2026-27	90%	

TARGETS FOR INDUSTRIAL BATTERIES

YEAR	COLLECTION TARGET (MIN)	100% by end of 7 years
2022-23	40%	
2023-24	50%	
2024-25	60%	
2025-26	70%	
2026-27	70%	
2027-28	70%	
2028-29	70%	

Conclusions:

BWMR is a new legislation covering all types of batteries with multi stakeholders responsibilities. One has to wait and see how regulatory bodies, Central as well as State, are going to coordinate and work together to make BWMR a successful legislation in the shortest duration. Fine tuning of BWMR will also be done in the coming months. Let us hope that the industry will also come forward to understand BWMR properly and to implement BWMR voluntarily.

Bhilai Steel Plant Enhances Production of Special Steel Grades

Bhilai Steel Plant (BSP) has enhanced the production of special steel grades. The proportion of special steel grades in total volume of saleable steel in the current fiscal year period so far from April 22 to January 23 has been increased to 73.6 per cent as compared to 67.6 per cent in the entire last fiscal year 2021-22

Besides the special grade rails including R260 grade rails produced by the Plant, the other special steel grades include special grade plates, TMT Bars and Rods and special grade semis as well.

The special grade plates include Copper Bearing plates, Boiler Quality, Ship Building Quality, High Tensile and SAILMA Grades, SAILHard Grade, DMR 249 Gr-A plates for Indian Navy, Normalised Mild and Normalised Rolled plates, Plates thicker than 40 mm with NDT, IS 2062E 250BM(MA) and IS- 2062 E 250 Gr- C. The total volume of special grade plates produced in 2021-22 was 3,41,243 Tonnes whereas in April to Jan period of 2022-23, as much as 3,94,155 T of special grade plates have been produced.

Plant's Wire Rod Mill too produced special steel grades including Electrode Quality (EWNr) IS-2879 wire rods, TMT Rods, high corrosion-resistant TMT (HCRM) and earthquake resistant TMT (EQR-D) rods. The total volume of special grade Wire Rods produced from WRM in 2021-22 was 3,20,105 Tonnes whereas in April to Jan. period of 2022-23, as much as 3,04,525 T of special grades have been produced by WRM.

The Plant's Merchant Mill that produces special steel TMT bars including TMT (HCRM), TMT (Fe-600), TMT (550D) and TMT (Fe-500D) grades also produces light structural in special steel grades including SAILMA 2062 410 Gr. A, 2062 Cu, IS 2062 Gr-B (B0) and IS 2062 250/350 (BR) grades. Merchant Mill that produced 4,21,930 T of special steel grades in 2021-22 has in the current fiscal year, produced 4,61,121 T in April 22 to Jan 23 period.

BSP is proud of having provided the best and desired grades of steel for the Indian Railways, for dams, bridges and skyscrapers and for critical and important projects of national importance in defence, energy sector, space exploration etc. Steel produced by Bhilai has been used to build Indian Navy's aircraft carrier INS Vikrant and other warships.

Source : SAIL Press Release

India's Power Scenario - 2023

India's electricity demand in 2022 grew by 8.7%. Coal generation increased by 8.7%. In 2023, India will gear up to implement energy transition strategies by addressing issues related to energy security. These include building local supply chains, securing domestic fuel resources, deepening power sector reforms to address structural issues, and continuing to adopt new and clean technologies by creating demand and infrastructure.

India's clean energy transition is advancing; however, coal will stay to boost energy security. Announcements for coal sector for some brownfield expansion projects, delays in retirements or even lifetime extension plans for old thermal plants, and liquidation or revival of part of stalled private sector projects is on the cards.

Securing fuel is top priority to respond to short-term challenges, while implementing reforms is on the long-term transition agenda. India's coal production to increase, however, import dependence may also continue in the power sector to fulfil the rising demand in 2023. Meanwhile, to boost gas demand government will adopt strategies to shield against the rising price volatility.

The total installed capacity reached 410 GW, of which renewable capacity is 121 GW at the end of 2022. Although missing the 175 GW target for 2022 by about 30%, India's renewable sector continues to grow driven by policy focus on clean energy resources with about 90% of capacity additions in 2022 coming from renewables. There are more than 70 GW in the renewables pipeline in different stages of development as of the end of 2022. However, about 40% of this pipeline is delayed beyond its schedule and may be marred with high risk of further delays or even cancellations in the current high-cost environment.

Renewables supply chain issues continue to impact project costs and pipeline growth. While the supply chain pressures may ease, for example, global solar module prices again start going down, but impact on project costs will not translate in 2023.

Lack of support mechanism to keep offshore wind from taking off. India is planning to issue one of its first offshore seabed lease rights tender for 4 GW of offshore wind projects off the coast of Tamil Nadu. It may be challenging to finance the offshore wind projects in India, which have higher execution risks, a complex project development cycle, and a lack of local expertise in the technology and no fiscal support mechanism.

Reform agenda for markets

1. Power market sentiments will remain fragile with elevated power prices in the short-term market. While the pace of reforms remained encouraging in 2022, with implementation of general network access (GNA), the ancillary services market (ASM) for tertiary reserves, and new deviation settlement mechanism (DSM) structure. However, hiccups in the DSM with unrealistic high prices, and grid instability would require the regulator to focus on stabilizing the market.
2. Renewable Energy Certificate (REC) market goes through an overhaul, but regulatory uncertainty around implementation of new rules with no floor pricing remains. The suspension of the floor price may affect small-scale renewable developers with higher costs and economic models based on REC revenues, but at the same time, removing the floor may help drive the demand for RECs for obligated consumers.
3. Ongoing reforms may improve short-term financial discipline of DISCOMs; however, the structural issues will linger. Proposed amendments through the Electricity (Amendment) Bill, 2022, aim to address the chronic issue of non-cost-reflective tariffs, a mandate for progressively cost-reflective retail tariffs, and rationalization of tariffs and cross-subsidies. However, this issue may not see any near term change due to political factors.

Big plans on climate

1. Climate action strategies are under way but need technological and financial support. Implementation of low-emission strategies will be the priority for 2023, including the carbon market framework. Access to low-cost, long-term financing remains a key challenge for the required leapfrogging of renewable additions.
2. India is betting big on green hydrogen across sectors; however, it's a long road for its adoption. In January 2023, the government approved the National Hydrogen Mission, with financial support of \$2.4 billion and target of minimum 5 Million Metric tonnes green hydrogen production per year. Currently, majority of the players are looking for hydrogen electrolysis technology partners and awaiting policy directions for demand creation in the domestic market as green hydrogen is uncompetitive compared with alternate fuels.

Source: S&P Global Commodity Insight, 06 February 2023

Imports of Ferrous Scrap: Jan. - Sept. 2022

- India was the world's second-largest steel scrap importer in the period (+17.7% to 4.515 million tonnes), with its main suppliers being the US (+14.3% to 423,000 million tonnes), UK (22.5% to 310,000 million tonnes) and Singapore (-2.2% to 271,000 million tonnes)
- China's steel scrap consumption was 6.7% lower on year at 170.83 million tonnes in 9 months of 2022,
- Turkey's steel scrap imports fell 10.5% in the nine-month period to 16.847 million tonnes, although it remained the world's foremost importer,
- Third biggest global importer was the Republic of Korea (+5.3% to 3.722 million tonnes). Its main suppliers were Japan (+1.4% to 2.381 million tonnes), US (+3.2% to 542,000 million tonnes) and Russia (- 23% to 291,000 million tonnes)
- EU-27 is the world's leading steel scrap exporter in the nine-month period

Source: Bureau of International Recycling

Innovative Steel Solutions for e-Mobility Applications

ArcelorMittal and I-FEVS (Interactive Fully Electrical Vehicles) have launched a new collaboration aimed at developing 'safe, light, sustainable, and affordable innovative' steel solutions for e-mobility applications.

The new I-FEVS solutions will use ArcelorMittal's advanced high strength steels (AHSS). The collaboration will cover the industrialization of battery envelopes and body frame structures, the exploration of advanced steel solutions for micro-mobility solutions, ultralight AHSS structures, and the integration of solar panel structures into EVs.

It is aimed to develop safe and lightweight e-mobility solutions using steel by optimizing designs in the most effective way to achieve mass-market adoption.

Source: Weekly news from Steel Times International, Feb. 15, 2023

SSAB to Explore Sustainable Quicklime Use in Steel Production

SSAB, a Swedish steel technology company and a limestone producer will conduct preliminary research on incorporating sustainably produced quicklime into SSAB's steelmaking process. *SaltX Technology*, which specializes in large-scale energy storage solutions and electrification technology and SSAB have signed a letter of intent, for a

preliminary study to take place this year on incorporating sustainably produced quicklime into SSAB's steelmaking process.

SaltX is trying to scale up a lime production innovation it calls electric arc calcination, which aims to replace fossil fuels with renewable electricity in lime production. Through the SaltX process, limestone is heated to elevated temperatures, and the carbon dioxide that is then released is isolated and separated.

SMA Mineral and SaltX are working together on building an electric arc calciner, and are looking to ship 40,000 metric tons of climate-neutral quicklime to customers, primarily steel producers, in 2025.

SSAB is clear that they want climate-neutral quicklime for their steel production.

Source : AIST Steel News Rewind, 16 Feb.2023

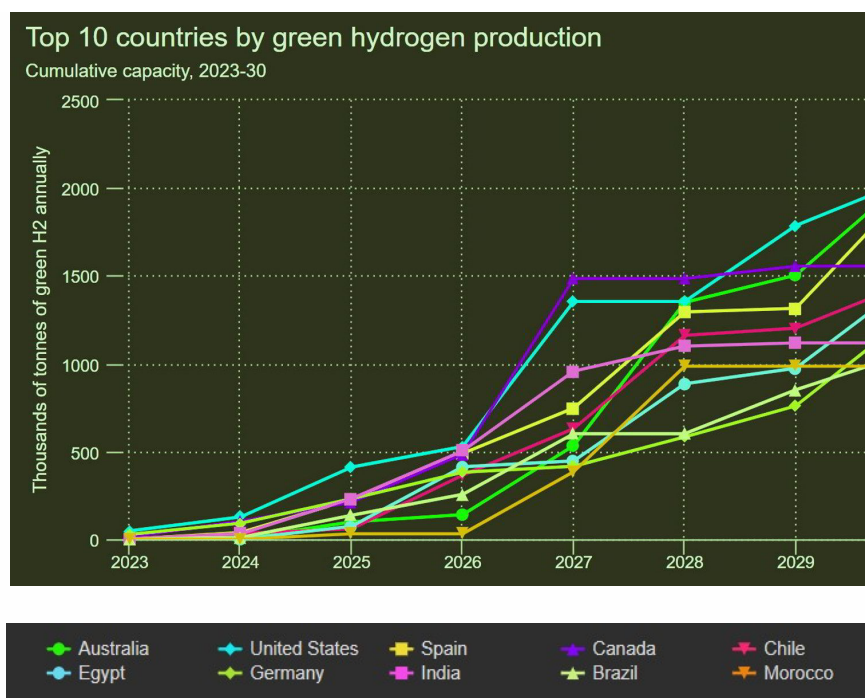
Which 10 Countries will be the Biggest Producers of Green Hydrogen in 2030?

China is widely expected to be up there. There are smaller nations that are aiming to become global players in renewable H₂, such as Namibia, Mauritania and Oman. But According to *Hydrogen Insight*, none of these nations will be in the top ten in 2030.

Newly updated assessment of announced green hydrogen projects and targets around the globe shows that Australia, the US and Spain will lead the market at the decade's end, followed by Canada, Chile, Egypt, Germany, India, Brazil and Morocco.

Australia makes a surprise entry, mainly thanks to the Australia Renewable Energy Hub that can start in 2030. Spain's position among the top players is not surprising, as the Spanish government has approved ten major projects already, including Fertiberia and Iberdrola's Puertollano project, which was commissioned last year and is expected to produce 200,000 tonnes of green hydrogen annually.

Renewable-energy superpower China has not made it into the 2030 top ten list, mainly due to Beijing's current targets. The Chinese government has set a target of 200,000 tonnes of green hydrogen being produced annually from 2025. That means their target is nowhere near the 10 million tonnes production target in the EU, and the US is planning around the same amounts.



Top 10 Countries by Green Hydrogen Production

**Top 10 countries by green hydrogen production
(cumulative capacity), 2023-30**
(thousands of tonnes annually)

▲	Australia	US	Spain	Canada	Chile	Egypt	Germany	India	Brazil	Morocco
2023	0.6	47.3	1.7	14.7	2.6	0	27.1	2.1	0	0
2024	3.1	127.2	38.2	101.7	32.5	0	91.7	30.8	10	0
2025	98.8	410.8	228.1	212.1	59.4	74.2	231.2	231.4	136.8	31
2026	139.8	528	489	484.4	364.9	412.8	381.7	502.7	255.4	31.1
2027	533.2	1,354	747.2	1,484.4	629.9	446	415.3	957.1	601	384.9
2028	1,348.6	1,354	1,294.4	1,484.4	1,160.4	885.7	582.9	1,099.6	601	984.9
2029	1,503.6	1,785.8	1,314.6	1,555.2	1,201.7	973.6	759.3	1,118.2	851	984.9
2030	2,051.2	2,041.4	1,981.7	1,555.2	1,455	1,449.9	1,258.7	1,118.2	1,057.2	984.9

Source : Hydrogen Insight, 17 Feb. 2023

Global Hydrogen Demand to More Than Triple by 2050

The global demand for hydrogen will increase by a factor of 3.3 by 2050, with growth coming from a wide range of sectors, led by power generation, aviation and heavy industry, according to a new report.

The study, *Hydrogen Supply and Demand Outlook, 2020-2050: Growth Amid Constraints*, says global H₂ production will rise from 72.2 million tonnes (MT) in 2020 (and 77.6 MT in 2022) to 251 MT by mid-century.

Most of the demand growth will come from “new” energy sectors — led by aviation, power generation/energy storage and heavy industry (around 45-50 MT each), and also shipping, road transport and residential/commercial heat. Global aviation industry projected to need 120 million tonnes of clean hydrogen a year by 2050. However, demand will also grow by 18% in the incumbent industries of chemicals (including fertiliser) and oil refining.

Nearly all demand in ‘new’ energy sectors will be met by clean hydrogen to advance decarbonisation goals, and unabated production feeding incumbent sectors will continue to be phased out through the 2050s.

17% of the hydrogen (42.7 MT) would be traded across borders, mainly from areas with abundant wind and solar power, such as Australia, Chile, North Africa and the Middle East, to “carbon-conscious energy importers” in the EU and East Asia.

67% of the H₂ in 2050 would be green, with 16% (40 MT) being blue (made from fossil fuels with capture and storage). That leaves 17% (42.7 MT) being made from unabated gas or coal — not even a halving of today's grey H₂ production.

However, according to the International Energy Agency, the world will need to produce 520 MT of clean hydrogen annually by 2050 to reach net zero; Bloomberg NEF puts this figure at 500 MT; the International Renewable Energy Agency forecasts 614 MT in its 1.5°C scenario; while the Hydrogen Council expects 660 MT to be produced by mid-century.

In addition to high production costs, hydrogen deployment will be constrained by the pace and scale of required investment and construction and, perhaps most importantly, competition with other low-carbon solutions like direct electrification through batteries or heat pumps.

If the global energy system shifts more toward 2050 net-zero targets, hydrogen will have a larger role to play.

A forecast expects 32.5 billion tonnes of greenhouse gas emissions being released into the atmosphere in 2050 — only a 9% reduction from peak emissions in 2028.

Source: *Hydrogen Insight*, 27 Jan. 2023

Demonstration Plant for the Production of Green Steel Using Renewable Hydrogen

The European Commission has approved, under EU State aid rules, a €55 million German measure to support **ArcelorMittal Hamburg GmbH** ('ArcelorMittal') in building a demonstration plant for the production of green steel using renewable hydrogen. The measure will contribute to the achievement of the *EU Hydrogen Strategy* and the *European Green Deal* targets, while helping to reduce dependence on Russian fossil fuels and fast forward the green transition in line with the *REPowerEU Plan*.

The German measure

Germany notified to the Commission its plan to support ArcelorMittal's project to partially decarbonise its steel production in Hamburg.

The aid, which will take the form of a direct grant of €55 million, will support the construction and installation of a demonstration production facility using 100% renewable hydrogen. The main objective of the project is to apply technology aimed at reducing greenhouse gas emissions in ArcelorMittal's green steel production processes. The plant will have an annual capacity of 100,000 tonnes of direct reduced iron, a key input for steel production.

This new industrial scale demonstration plant will provide ArcelorMittal with valuable insights into the production of high-quality emissions-free steel. ArcelorMittal will use the experience gained at the demonstration plant to decarbonize its steel production in the EU on a larger scale. Moreover, ArcelorMittal has committed to share its technical know-how with other European steel producers.

The demonstration plant is envisioned to start operating in 2026. Once completed, the project is expected to avoid the release of over 700,000 tonnes of carbon dioxide in total.

The Commission's assessment

The Commission found that:

- The project is amongst the early adopters of an innovative technology in its sector, namely technology using 100% renewable hydrogen in the production of direct reduced iron for steel.
- The measure facilitates the development of an economic activity, in particular the production of green steel. At the same time, it supports the objectives of key EU policy initiatives such as the *European Green Deal*, the *EU Hydrogen Strategy* and the *REPowerEU Plan*.
- The aid has an 'incentive effect', as the beneficiary would not carry out the investments in green steel production without the public support.
- The measure has a limited impact on competition and trade within the EU. In particular, it is necessary and appropriate to promote the production of green steel. In addition, it is proportionate, as the level of the aid corresponds to the effective financing needs. Furthermore, if the project turns out to be very successful, generating extra net revenues, the beneficiary will return part of the aid received to Germany (claw-back mechanism).
- The aid brings about positive effects that outweigh any potential distortion of competition and trade in the EU.

On this basis, the Commission approved the German measure under EU State aid rules.

AM/NS Plan to Reduce its Emissions Intensity

The AM/NS joint venture in India has developed a plan to reduce its emissions intensity and is currently working on a 2030 target (which it is yet to be announced).

- The blast furnace was seen as the best technology for that expansion, but the potential to add on carbon capture and storage solution to the furnaces in the future will partially offset their carbon footprint.
- The enterprise will also consider using hydrogen in the blast furnaces, which will then result in a further decrease in emissions.

- AM/NS also has DRI-based capacity, which it can convert to green hydrogen when it becomes economically available. 5 million tonnes out of 14 million tonnes will have the potential of working on a very high H2 percentage.
- Other AM/NS decarbonization efforts include the announced \$600 million investment in a 975 MW renewable energy project, which will supply 20% of the electricity the Indian joint venture operations consume.

The journey to net zero for the steel industry will require more than one technology route — one utilizing green hydrogen and the other carbon capture utilization and storage, and a third [being in development is] direct electrolysis. The International Energy Agency, for example, forecasts that over 50% of steelmaking will be capture utilization and storage-based by 2050.

Green Aluminium

Primary aluminum is aluminum produced from mined ore. While primary aluminum is much more energy intensive than recycled (or secondary) aluminum, because demand for aluminum is forecast to grow substantially in coming decades, the world needs to produce substantial amounts of primary aluminum to meet demand.

There are two primary aluminums: one dirty, one clean. Because the significant majority of emissions from the primary aluminum industry are emissions related to energy use, the carbon intensity of primary aluminum varies substantially. A metric ton of primary aluminum produced with hydroelectricity releases about 4 metric tons of CO₂e. Meanwhile, a metric ton of primary aluminum made with coal-fired electricity releases 18-20 metric tons of CO₂e, more than three times more.

Thus, while aluminum can be very carbon-intensive, there is a pathway to position low-carbon aluminum as a key material for our sustainable future. Powering primary aluminum smelters to operate with renewable energy will be a step towards transitions to a low-carbon economy.

Net-zero Public Data Utility

Today, climate transition-related data, including key data on company greenhouse gas (GHG) emissions and emission reduction targets, is not reported consistently, and there are often barriers to accessing this information. For companies, calculating their overall

carbon footprint can be costly, and the lack of accessible data can make benchmarking against peers challenging. Regulators, investors, and other stakeholders who aim to develop robust net-zero strategies can struggle to source the comparable, high quality underlying data necessary to do so. Access to key climate transition-related data enables action and encourages accountability.

Better information, accessible by everyone, will help accelerate the transition toward a net-zero economy.

To address this global data challenge, and to serve the climate objectives of the United Nations by driving forward global momentum to build a broadly accessible foundation of high-quality climate data that is critical to delivering a net-zero economy.

It has been proposed to develop a **Net-Zero Data Public Utility** (NZDPU or Utility), an open, free, and centralized data repository that would allow all stakeholders to easily access key climate transition-related data, commitments, and progress of businesses and financial institutions toward those commitments.

Several focus groups will contribute their input to the Utility as it is designed and built. The focus groups will gather diverse industry players to discuss challenges and opportunities in the climate transition-related data space.

NZDPU Focus Groups are for the following user segments:

- Financial Institutions
- Assurance, Verification, and Data Service Providers
- Real Economy Companies and Corporates

Utility will make it easier and more transparent to determine whether private sector businesses are delivering on climate commitments.

The open-data public utility will collect and aggregate net-zero climate transition data by drawing on private sector climate commitments. It is intended that the NZDPU will bring transparency to efforts to transition to a net-zero economy by addressing data gaps, inconsistencies, and barriers to information that slow climate action. It will provide accurate, trusted and verifiable climate transition-related data, openly available in a single place for the first time.

The lack of availability of accessible, high-quality, and consistent data remains one of the biggest challenges for organizations' development and implementation of net-zero

transition plans. Civil society, investors, regulators, and policy makers similarly require this data to compare and evaluate those plans. The NZDPU will arm financial institutions with the information they need from the companies they finance so that they can then develop and execute on their own transition plans. The utility also will support efforts in developing and developed nations to enhance transparency for business climate action commitments and will be available to the market, regulators, climate scientists, and civil society.

By providing freely available data capturing the breadth and depth of emissions and target reporting, the NZDPU provides a powerful feedback mechanism for financial institutions, companies, and governments. The data uploaded in the NZDPU will be freely available on an open basis as a public good for stakeholders to use as they see fit. Going forward, stakeholders will be able to track companies and financial institutions' climate progress, including through highlighting gaps between their metrics and targets and headway relative to peers. In this way stakeholders can assess the extent to which any shortfalls in progress are idiosyncratic, reflecting the institution itself, or the product of broader factors.

The following groups have been set up to work alongside the Committee and provide expert input through the Utility's development:

- Civil Society and Expert Advisory Panel
- Financial Institution focus group
- Assurance and Verification Providers focus group

The following group is in the process of being established:

- Corporate focus group

The intention is for the NZDPU pilot to ultimately be hosted by the United Nations Framework Convention on Climate Change (UNFCCC) Global Climate Action Portal.

Without consistent, comparable and accessible data on corporate emissions, investors have no leverage to push companies to act and the public has no way to hold them accountable. That opens the door to greenwashing and prevents investors who have made ambitious climate commitments from making decisions that help them reach their goals. It adds up to a big problem – and the data portal will be a big step towards fixing it by making climate data more reliable, accessible, and transparent.

Data availability and quality remain some of the biggest challenges in the development and implementation of actionable net-zero transition plans. It hampers stakeholders' ability to access the data they need to establish an emissions baseline, set targets, develop plans for clients' and companies' emissions reductions and assess progress. Net-Zero Data Public Utility (NZDPU), is a first-of-its-kind, open-data utility. NZDPU will provide individuals, companies, and governments with a trusted central source of verifiable data to track and understand firm GHG emission footprints, and to assess progress against emission reduction targets.

Effective action against climate change requires consistent, high-quality data that is accessible to a wide range of stakeholders around the world. For too long, imbalanced or asymmetric information has hampered the capacity for truly global coordination and action to accelerate the net-zero transition. The Committee's work will address those challenges by providing data on an open access basis and with meaningful input from developing economies and others at the heart of the fight against climate change.