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Metal Market Magazine

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Covid and conflict drive volatility

Beside the growing cost in human life and suffering of the war in Ukraine, the direct and indirect consequences of the conflict dominate analysis of international steel and metal supply chains. Whether, for example, it is the impact on supplies of nickel or aluminium from Russia or steel slab from Ukraine, the effects are rippling out widely, while surging gas and electricity costs are affecting energy-intensive industries internationally.

Meanwhile, a renewed lockdown in Shanghai, as China reacts to the latest wave of Covid there, has added further uncertainty to metal markets.

Creating stability and price certainty for its customers in volatile markets is a core mission of Flack Global Metals. In our cover profile interview with founder and CEO Jeremy Flack, he explains that vision, the path leading to his career in steel supply and financial services, as well as the dedication required to become a successful entrepreneur.

In trying to achieve greater control over the iron ore supplies needed for its huge fleet of integrated steelworks, China's government is discouraging price speculation while supporting plans for a major increase in domestic production, as a feature article in this issue explains.

A separate article about investments in, and governmental policies for, India's steel industry outlines progress in that nation's aims to expand production and develop domestic supplies of steelmaking raw materials.

Our latest list of new plant orders gives a snapshot of significant investments in new plants and technologies for steel and non-ferrous metal production globally.

Although its price has risen, copper has seen a less dramatic increase than other base metals, but the role it will play in energy transition and electrification continues to make the red metal a vital focus of interest. Our copper market overview article considers prospects for its future supply-demand balance.

Also important for energy transition, lithium and its future sources have also fallen under the spotlight. In an interview with Fastmarkets, leading representatives of mining in Argentina outlined its intentions to develop as an important supplier.

A separate piece looks at the fortunes of graphite markets.

Applications of artificial intelligence and machine learning are becoming increasingly diverse, finding use in business functions such as procurement, finance and HR, as in in-depth interview with SAP's metals industry lead reveals. Lastly, an end-user spotlight article looks at the recovery in automotive markets and the growing share of electric vehicles within them.

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'The effects are rippling out widely, while surging gas and electricity costs are affecting energy-intensive industries internationally'

Metal Market Magazine

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News review: non-ferrous

Mining in new paradigm, Collahuasi executive says

The mining industry is entering a new paradigm with sustainability becoming deeply integrated into business strategies, and there will be numerous consequences from this, the executive president of Minera Collahuasi has said.

According to Jorge Gómez, speaking at an industry conference, companies are now facing demands from multiple stakeholders that they have a positive effect on society. These include investors, who are increasingly choosing to fund companies with a better environmental, social and governance (ESG) performance, Gomez told CRU's World Copper Conference in Santiago, Chile, which took place in March 28-30.

Suppliers, meanwhile, are under pressure to have a positive ESG influence, while communities have raised their expectations regarding the licenses to operate that are awarded to mining companies, he said. Similarly, governments have stepped up the pressure on companies to collaborate with the social agenda, while employees are looking to work at companies that raise their ESG standards, and markets are incorporating higher ESG demands, Gomez said.

Transforming the copper industry to meet these demands is increasingly important, particularly given the metal's role in energy transition due to its use in renewables and electrification, he told delegates.

"There is a hunger to know what it is we're doing [as an industry], how we're doing it, and what our legacy will be," Gomez said. "We must have a business that is managed impeccably; development arises from doing the job properly."

LG Energy Solution, Stellantis establish EV battery JV

South Korean battery manufacturer LG Energy Solution (LGES) and Netherlands-based automaker Stellantis have executed a binding, definitive agreement to form a joint venture (JV) that will produce lithium-ion batteries for electric vehicles (EVs), the former said on March 24. The JV will invest more than C$5 billion ($4.1 billion) to establish operations, including a battery plant in Windsor, Ontario, Canada.

The battery plant will produce lithium-ion battery cells and modules, which will be supplied to Stellantis for its EV production in North America. Annual capacity of the plant should exceed 45 GWh, LGES said.

Construction of the plant will commence later this year and the company expects production to begin in the first quarter of 2024. LGES and Stellantis expect the plant to be a catalyst for the establishment of a strong battery supply chain in Windsor, which is home to Canada's largest automotive cluster.

With this battery plant, LGES has now secured annual capacity of above 200 GWh in North America. Stellantis previously announced plans to reach annual global EV sales of 5 million units by 2030. The company also raised its planned battery capacity by 140 GWh to 400 GWh, which will be supported by five battery plants and additional supply contracts, the company said.

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Demand for environmentally friendly production of copper for energy transition is set to surge

World needs 'all mined copper from past 600 years' in next 25 years

Over the next 25 years, the world will need the equivalent of all the copper mined since the 1400s to meet the demands of the green energy transition, the chief operating officer of Rio Tinto's copper business has said. "If we look long-term, the scale of the challenge is quite significant. In the next 25 years, we'll need all of the copper that's been mined in the past 600 [years], just to make things work," Clayton Walker told delegates at CRU's World Copper Conference in Santiago, Chile, which took place in March 28-30.

"Nothing short of a green energy revolution is required for the world to move toward net-zero greenhouse gas emissions over the next 30 years, and copper will play a key role in this," he added.

Noting that decarbonization is a big driver of copper demand, Walker said that additional green demand is expected to account for more than one-quarter of total demand in the net-zero-carbon scenario. As part of this, Walker estimated that rapid electrification of the grid would add around 5 million tonnes to copper demand by 2050.

Solar and wind generation consume around 3 and 6 tonnes of copper per MW respectively, compared with around 1 tonne per MW for thermal power. Electric vehicles, meanwhile, typically contain 80 kg of copper compared with about 20 kg in an internal combustion engine vehicle.

Vale to supply Northvolt with nickel products

Mining major Vale has signed a multi-year deal to supply Swedish lithium-ion battery producer Northvolt with low-carbon nickel products to enable it to serve the fast-growing electric vehicle (EV) market, the Brazilian company has announced.

After two years of negotiations, the deal reinforces the companies' shared commitment to sustainability in the EV supply chain and the electrification of the broader mining industry, Vale said on Tuesday March 22.

Vale, one of world's top nickel suppliers, produced 168,000 tonnes of nickel in 2021, down by 8.55% from 183,700 tonnes in 2020. Its 2022 production guidance is 175,000-190,000 tonnes.

With the EV boom globally, demand for nickel sulfate, one of the key ingredients in EV batteries, is surging, and its price is also rising fast amid low nickel stocks. But the recent chaos in the nickel market has seen market participants choosing to stay away from the spot market, sources said.

Fastmarkets' weekly price assessment for nickel sulfate min 21%, max 22.5%; cobalt 10ppm max, exw China was 44,000-47,000 yuan ($6,904-7,374) per tonne on Friday March 18, unchanged from a week earlier, but the highest level since Fastmarkets started assessing the market in 2018.

Hyundai to start EV, battery production in Indonesia

South Korean automobile manufacturer Hyundai Motor Co has earmarked Indonesia for electric vehicle (EV) and battery cell manufacturing. The company will open its first

automobile manufacturing plant in Indonesia and its first EV plant in Southeast Asia, Hyundai said on March 16.

The Hyundai Motor Manufacturing Indonesia plant is located in the Deltamas industrial complex near Cikarang, 40 km east of Jakarta. It will produce both the Creta sports utility vehicle and the Ioniq 5 battery EV.

Construction was completed in December 2021. It has an initial production capacity of 150,000 units per year. Hyundai plans to ramp up the capacity to 250,000 units per year by investing approximately $1.55 billion. Hyundai's Ioniq and Kona EVs accounted for 87.3% of total EV sales in Indonesia in 2021.

It is also working with LG Energy Solutions to establish a battery cell plant in Karawang. Construction of the new battery cell plant is expected to be completed in the first half of 2023, with production starting in 2024.

Hyundai is targeting to sell 1.87 million EVs annually by 2030, including 17 new models for its Hyundai and Genesis brands. It aims to have 7% global market share by the same year.

LME suspends warranting of Russian Cu, Pb and Al in UK warehouses

The LME announced an immediate suspension on Friday April 1 on the placement of Russia-origin copper, lead, primary aluminium and aluminium alloy brands on warrant in LME warehouses in the UK.

"Following the announcement by the UK of 35% additional duties on imports of Russian copper, lead, primary aluminium and aluminium alloy, this notice announces an immediate suspension on placing the brands listed in appendix 1 on warrant in LME-listed warehouses in the UK, unless the warehouse can establish that the exportation date from Russia was prior to March 25, 2022," the exchange said in a notice to members.

There was currently no metal in LME-listed warehouses in the UK produced by the entities listed by the LME, so the existing stocks of copper, lead, primary aluminium and aluminium alloy on warrant will not be affected.

The notice explained that the exchange was "concerned" that any metal which was subject to the regulations and which was put on warrant in LME-listed warehouses in the UK would not be able to be removed from warrant and imported into the UK without significant additional cost.

"Equally, the cost of shipping the metal elsewhere could be prohibitive," the LME said. "Therefore, in respect of metal that is subject to the regulations, there is a significant risk that there will be a dislocation between the price of the traded metal, and the price of the underlying physical metal."

The exchange said that the new regulations were being put in place to minimize the risk of any such price dislocation and, in turn, any possible market disruptions or disorderly market conditions.

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Investments and international collaborations to secure EV battery supply chains are accelerating

EU, US to develop robust battery supply chains

The European Commission (EC) and US Department of Energy (DOE) announced on March 16 that they support collaboration between the European Battery Alliance and US LI-Bridge alliance to accelerate the development of "robust" battery supply chains. The initiative between the United States and European Union is to help both reach decarbonization and energy transition goals.

"Batteries are critical to a clean energy economy. They help decarbonize the transport and energy sectors, by electrifying vehicles and providing stationary storage for the renewable-powered grid. Advancing the battery supply chain therefore requires an all-hands-on-deck, global approach," the announcement read.

The alliances are looking into developing industrial capacity that can meet growing demand for batteries in both transportation and energy systems. Sustainable and ethical sourcing of critical raw materials and accelerating battery recycling and reuse, including recovering critical raw materials, are also a focus for the alliances.

The collaboration and focus on ways to balance battery raw materials market fundamentals comes as prices for materials such as lithium has boomed throughout the past year due to demand from decarbonization efforts outpacing supply.

The US government announced on February 24 that it will invest in local sustainable battery supply chains to reduce its overexposure on external sources for critical minerals.

Restart of Chinese Al smelters pushed daily output to 9-month high

Domestic aluminium production in China rose to 6.3 million tonnes in the first two months of 2022, with average daily output reaching its highest daily total since June 2021, at 107,288 tonnes, according to data from China's National Bureau of Statistics (NBS).

Chinese aluminium smelters began restarting operations this year after being forced to cut output when China introduced strict curbs on energy usage in August-September 2021. The smelters are increasing capacity and production to be in a position to benefit from improving margins as a result of higher aluminium prices, sources told Fastmarkets.

Market participants said that up to 1.6 million tonnes of aluminium smelter capacity has been revived since January, including 0.8 million tonnes in Yunnan province in southwest China, which mainly uses environmentally friendly hydroelectric power.

The increase in supplies has put a cap on spot prices, despite destocking in the domestic market, sources said. Aluminium stocks on Shanghai Futures Exchange fell 24,881 tonnes, or 7.5%, to 308,942 tonnes in the week to Friday, March 25.

"Domestic supply is going to increase, with around 1 million tonnes of capacity [being revived] in the coming months, while demand is currently capped by the [latest Covid-19] outbreaks," a Shanghai-based trader said.

"Smelter margins have continued to climb, alongside aluminium prices, and hit their highest level since last November at the beginning of March," an east China-based trader said. "But I've seen some downward pressure in the domestic market," they added.

News review: steel

'Our outlook is very bullish': CMC's Smith

A combination of factors including record second-quarter fiscal results, strong end-market demand and positive historic indicators have boosted Commercial Metals Co (CMC) confidence and outlook for the coming months.

"Our outlook for fiscal year 2022 is very bullish," Barbara Smith, CMC's chairman of the board, president and chief executive officer, said in the company's second-quarter earnings call on March 17.

Robust end-market demand and healthy margin levels are key to CMC's upbeat outlook. "Areas that were hot in the pandemic continue to see strong demand," Smith said, noting that recent new project quotes have been well-balanced across the public and private sectors as well as multiple industries.

The current market strength will be further fortified beginning next year by potential orders stemming from the $1.2-trillion infrastructure package in the United States, which CMC estimates "will add 1.5 million tons of incremental rebar demand to the market at full run rate," Smith said.

Biocarbon producer gets green steel funding

Renewable biocarbon products producer Aymium has secured funding for a capacity expansion and the deployment of its environmental technology for use in steelmaking, the company announced on March 1. Aymium's new partners include Rio Tinto, Steel Dynamics Inc (SDI), Nippon Steel Trading and the lead investor Sandton Capital.

St Paul, Minnesota-based Aymium produces biocarbon from recovered and unusable wood, replacing the use of coal with the biocarbon in the steel production process. The technology is said to produce the only commercially demonstrated carbon-negative input for global steel production.

"Aymium's products allow immediate replacement of fossil fuels with renewable, carbon-negative inputs without any changes to existing manufacturing processes or equipment," Aymium chief executive officer James Mennell said in an announcement.

Proceeds from the financing will be used to underwrite the construction of Aymium's production facilities in Williams, California, and in the Pacific Northwest. Both facilities are expected to be operational in 2023. Production from the facilities is contracted through 2037.

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Steel market strength in the United States is expected to be fortified by a $1.2-trillion infrastructure package

Brazil's Usiminas names Alberto Ono as new CEO

Brazilian flat-rolled steel producer Usiminas has appointed Alberto Ono chief executive officer, succeeding Sergio Leite de Andrade, effective May 19. Leite de Andrade will become chairman of the company's board of directors, the company said on March 28.

The move comes in step with a shareholder agreement signed April 2018, when Ternium/Techint Group and Nippon Steel, major shareholders in Usiminas, agreed to alternate nominations for management positions.

A metallurgical engineer, Ono is the company's chief financial and investor relations officer. He has worked at Usiminas for the past 13 years. Leite de Andrade has worked at Usiminas for 45 years, the most recent 14 of which he served as a member of the executive board.

Schnitzer launches net-zero long steel product line

Schnitzer Steel Industries is creating a line of net-zero carbon products – dubbed GRN Steel – in a step toward achieving the company's sustainability goal of net-zero emissions by 2050.

The GRN Steel brand, being developed and to be produced at Schnitzer's McMinnvile, Oregon Cascade Steel operations, will be available in the form of reinforcing bar, wire rod and merchant bar, Schnitzer announced on March 7.

Cascade will partner with ACT Commodities, a carbon offset broker, to identify carbon offset projects to address Scope 1 emissions from the production of GRN Steel, the company said. Upon selling GRN Steel products, Cascade will retire credits on behalf of a customer in an amount commensurate with the carbon footprint of steel ordered.

Nucor orders plant for new steel project

Nucor has signed SMS group Inc to supply a complete meltshop for a mill the steelmaker is building in Mason County, West Virginia. The scope of the meltshop project includes two 190-tonne direct-current electric-arc furnaces, two twin-ladle furnaces and two vacuum tank car degasser facilities, SMS said in a March 25 release. Project completion is expected by 2024, with hot commissioning beginning in the second half of that year.

Rolling technology for the new mill will be supplied by plantmaker Danieli, which announced on March 23 that it had been awarded a contract to install rolling equipment and automation technology at the greenfield mill. The QSP-DUE Danieli Universal Endless plant being installed at the new mill will produce 3.0 million short tons annually of hot-rolled steel strip in dimensions up to 2,100mm wide and from 0.8 to 25.4 mm thick.

Voestalpine moves closer to all-EAF steel production

Austrian steelmaking group Voestalpine intends to replace coal-fueled blast furnaces with climate-friendly electric-arc furnaces (EAFs) powered by green electricity at its sites in Linz and Donawitz by 2027, the company said on March 23. The final decision to invest in EAFs will be made by Voestalpine's supervisory board in 2023, the company said.

In step with the project plan, Voestalpine will begin clearing the necessary areas and convert infrastructure at Linz and Donawitz this summer, to allow the start of EAF construction in 2024. The two EAFs should begin operations by early 2027, the company said.

The estimated investment during the first phase from 2022 to 2024 will be in the low triple-digit million-euro range, with total investment estimated around €1 billion ($1.1 billion), according to the company.

Quotas to replace 232 tariffs for UK

The United States and United Kingdom have reached a deal that will replace the Section 232 tariffs applied to US imports of steel and aluminium products from the latter country with a quota system, the US Department of Commerce announced on March 22.

Effective June 1, the existing 25% tariffs on steel will be replaced with a tariff-rate quota (TRQ) set at 500,000 tonnes on 54 product categories, according to the announcement. The steel quotas will be administered on a quarterly basis, with the 25% tariff applied to volumes that exceed the assigned limit, provided they are not subject to an exclusion.

As part of the deal, tariffs applied to US exports that the UK imposed in response to Section 232 will also be lifted.

USW ends strike at Special Metals plant

Union employees at Special Metals in Huntington, West Virginia, voted on March 13 to ratify a new three-year labor contract and return to work. The action ends a strike that began on October 1, 2021, at the world's largest nickel-alloy specialty steel plant, according to a union source at United Steelworkers' Local 40.

The vote to ratify the new contract by the nearly 450 union members was approved by a narrow, 188-184 margin. Terms of the new labor agreement call for employees to receive a $5,000 signing bonus and raises of 2% and 3%, respectively, in the second and third years.

Precoat Metals acquired in $1.28bln transaction

AZZ Inc has agreed to acquire the Precoat Metals division from Sequa Corp for approximately $1.28 billion, AZZ said in a press release issued on March 7. Precoat is North America's largest independent provider of metal coatings,

The acquisition "significantly broadens our metal coatings offering, creating unrivalled scale and breadth of solutions in both the prepainted and post-fabrication coatings markets," Tom Ferguson, chief executive officer, said in the release. It represents "a continued transition of AZZ from a diverse holding company to a focused provider of coating and galvanizing services for critical applications," he added.

Forth Worth, Texas-based AZZ said the acquisition, which is expected to close in the first quarter of its fiscal 2023, will be immediately accretive to earnings.

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International investments in new EAF-based steelmaking capacity are increasing

Commerce extends duties on plate from 12 countries

The US Department of Commerce has determined that removing anti-dumping and countervailing duties on certain carbon and alloy steel cut-to-length plate from 12 countries would likely lead to a continuation of the behavior, according to notices published in the Federal Register dated March 25.

The ruling applies to products including carbon and alloy steel hot-rolled or forged flat plate products not in coils, whether painted or not.

As a result of its expedited five-year sunset review for the 2017-21 period, the department set the following weighted-average dumping margins: Austria, 53.72%; Belgium, 51.78%; Brazil, 74.52%; China, 68.27%; France, 148.02%; Germany, 22.90%; Italy, 22.19%; Japan, 48.67%; Korea, 7.39%; South Africa, 94.14%; Taiwan, 6.95%; Turkey, 50.00%.

Supreme Court denies petition in 232 case

The US Supreme Court denied a petition on March 28 from importer Transpacific Steel and its foreign suppliers that challenged former US President Donald Trump's decision to double Section 232 tariffs on steel imports from Turkey on national security grounds.

Transpacific Steel and other steel importers filed suit with the US Court of International Trade (CIT), challenging the legality of the Section 232 duties. In its case, Transpacific Steel sought a refund of the difference between the 50% tariff imposed on steel imports from Turkey and the 25% tariff imposed on steel imports from most other countries.

In July 2020, the CIT agreed with plaintiffs, saying the tariff increase was a violation of statutory procedures and of equal protection guarantees. In a two-to-one decision in July 2021, however, the US Court of Appeals for the Federal Circuit confirmed the US President can boost Section 232 tariffs long after they were first implemented, overturning the CIT ruling that put a time limit on presidential tariff authority under Section 232.

Transpacific petitioned the Supreme Court to review that ruling in November 2021.

Nucor sees another strong year

Nucor Corp expects to achieve a new record for first-quarter earnings and to report another strong year thanks to continued solid demand across most of its end markets, the steelmaker said on March 17.

"We have recently announced price increases across the steel mills segment and expect profitability to improve," Nucor said in its press release. "Recent geopolitical events and the resulting price increases for steelmaking raw materials have accentuated the value of Nucor's adaptive business model and flexible raw materials profile."

China's crude steel output drops by 10% in January-February

China's crude steel and finished steel production declined significantly in the first two months of 2022, according to data released by the country's National Bureau of Statistics (NBS) on March 15.

Crude steel output for the two-month period totaled 157.96 million tonnes, down by 10.0% from a year earlier, while finished steel output weighed-in at 196.71 million tonnes, down by 6.0% year on year. ▶

News review: steel

ITC keeps pipe duties for Korea, Mexico and Turkey

The United States International Trade Commission (ITC) has ruled to maintain anti-dumping duties against imports of heavy-walled rectangular welded carbon steel pipe and tube from South Korea, Mexico and Turkey.

The revocation of the anti-dumping orders will "likely lead to continuation or recurrence of material injury within a reasonably foreseeable time," the ITC commented on the decision on March 4.

The five-year sunset review was initiated on August 2, 2021, and expedited on November 5, 2021. A full report on the ITC decision was scheduled to be made available on April 7, 2022.

Pacific Steel to build rebar mill in California

Reinforcing steel fabricator Pacific Steel Group (PSG) is building a new micro-mill in Mojave, California, with estimated annual capacity of 380,000 tons. The steel mill will be constructed at a net investment of approximately $350 million, and is expected to begin commissioning in early 2025, employing about 400 people.

The San Diego-based fabricator has chosen Danieli Corp to provide a MIDA hybrid micro-mill for the Mojave project. The hybrid micro-mill will have the capability to directly connect to renewable energy sources, and the aim is to lower carbon dioxide emissions through tapping into green energy.

Eric Benson, chairman of the board and chief executive officer of PSG, said, "We are excited about partnering with Danieli to build one of the cleanest, safest and most efficient steel mills in the world."

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China is emerging as a steel slab exporter amid shortages in international markets

China emerging as major slab source

China is on its way to emerging as a major steel slab supplier to the rest of the world amid shortages resulting from Russia's invasion of Ukraine. Since the war began on February 24 through the end of March, China has exported an estimated 300,000-400,000 tonnes of slab to global steel mills, particularly to Europe and Italy.

Data from China's General Administration of Customs shows that China's exports of slab under the Harmonized System (HS) code of 72071200 in 2021 were very small, while no exports were recorded in the first two months of 2022.

US Steel targeting sustainability at BRS operations

US Steel Corp expects its new ResponsibleSteel certification for steel production at the Big River Steel mill in Osceola, Arkansas, to help its customers meet their sustainability goals. The steelmaker received the site certification in North America from ResponsibleSteel, a third-party global provider of sustainability standards and certifications, US Steel announced on Monday April 4.

"Customers want rigorous standards that have been independently verified to help them achieve their own sustainability goals, and ResponsibleSteel provides the common platform for all assets of the steel value chain," the Pittsburgh-based steelmaker said.

US Steel had applied for the certification, company media relations lead Amanda Malkowski told Fastmarkets, noting that "the third-party audit was extremely intensive... There are only a handful of sites around the world that have been certified."

"The certification of a site demonstrates the commitment of a steelmaker to building a more responsible steel sector," ResponsibleSteel acting chief executive officer Alison Lucas said in the statement. "It stresses the importance of not only taking steps towards decarbonization, but also of prioritizing the health and safety of workers and operating with the utmost respect for human rights and labor rights and care for our natural environment."

ResponsibleSteel's standard is based on 12 principles with a wide range of topics, including greenhouse gas emissions, water stewardship and biodiversity, human rights and community relations. Its certification comes amid increased efforts in the global steel industry to reduce carbon emissions and boost environmental standards in a growing push toward global decarbonization.

Borusan to expand US capacity and market scope

Borusan Mannesmann is expanding its market targets and increasing its pipe production capacity in the United States to 400,000 tons from 300,000 tons, with a first-stage investment of $50 million, the Turkish company announced on Monday April 4. The company will expand its existing oil country tubular goods (OCTG) and line pipe operation in Baytown, Texas, to include a new mill capable of producing construction and general industry segments, in addition to expanding its OCTG range to provide tubing sizes.

"The new investment will provide solutions for a number of applications: special pipes to be used in machinery equipment production, pressure and applications requiring further processing and mechanical installation pipes that can be used in federal and state projects," Zafer Atabey, general manager of subsidiary Borusan Mannesmann Pipe US, said in a statement.

"We will have the opportunity to participate in federal projects that we have not been able to access until now," he said. "In addition to the oil and shale gas pipes market, in which we have been operating since 2014 by producing locally, our new investment will enable us to become a more local player in a different market."

Employment at the Baytown facility is expected to grow by 150 jobs in the first half of 2022. Borusan management said it is now targeting a market share of "5% or more in 2023 and beyond" with the addition of the new line.

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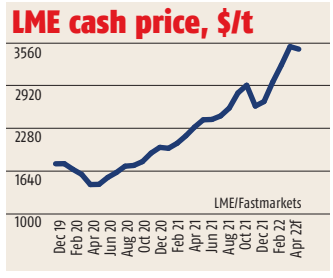
Market analysis

Aluminium

More disruptions extend bullish narrative

An eventful first quarter has seen many all-time highs for prices and premiums across the aluminium complex. This is in response to a myriad of drivers of the base metal markets, including soaring inflation, supply-chain snarl-ups, declining physical inventories, investor portfolio diversification and the historic short squeeze in LME nickel. For aluminium, the bullish narrative centers on heightened supply disruption risks associated with the war in Ukraine, sanctions on Russia and elevated energy costs in Europe. News flow in March included Australia's ban on alumina exports to Russia and a growing list of European aluminium plants forced to reduce output. The global

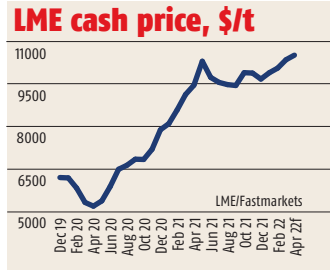


aluminium market was already heading for a big supply deficit this year, and such developments only widen the supply-demand imbalance. They also detract from concerns about slowing global economic growth and metal demand in coming quarters. The price outlook is still bullish, especially as long as sanctions on Russia remain in place and continue to disrupt flows of aluminium, its raw materials and energy.

Copper

Macro, fundamental forces to drive higher prices

Copper's recent performance has been relatively lethargic; prices rose by a modest 3.7% in March and less than 7% in the first quarter. But copper has rediscovered the $10,000 per tonne level and held it well, building a series of higher lows on the charts. These indicators suggest dip-buying appetite is still strong and that the underlying trend is still to the upside, giving the impression that the market is biding its time and preparing for a breakout move to the upside. Both macro and fundamental factors aligned with this positive short-term thesis. For example, high inflation is prompting investors to rethink their asset allocation

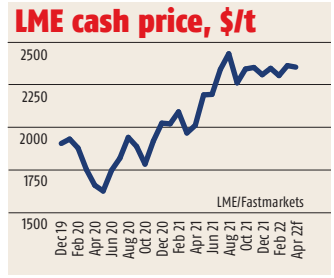


and to boost their exposure to commodities as a hedge against inflation, and China has entered a policy easing cycle. Copper demand continues to outstrip supply, and the supply-demand mismatch is drawing inventories lower. We expect copper prices to remain above $10,000 per tonne and even to record all-time highs this quarter.

Lead

Price may consolidate next

LME lead prices started April at around $2,400 per tonne, which was about where they started March. In the interim, they traded up to $2,700 per tonne as the frenzy from nickel's short squeeze spread across the complex, and as low as $2,200 per tonne in the immediate aftermath. Away from this technical distortion, the fundamentals and seasonal patterns warn that lead may be fairly priced again. Winter in the northern hemisphere is typically a strong period for replacement battery demand, and that has passed now. OEM battery demand is more important in spring, but this source of demand will be negatively affected

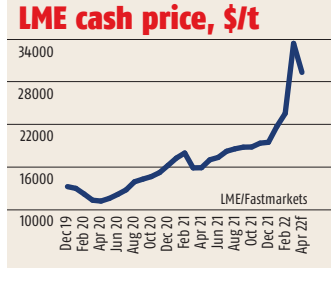


by the supply-chain disruptions faced by automakers. We would not be surprised to see lead's price performance soften in the weeks ahead, as it did in Q2 2021. We keep an eye on China as tightness in the West was only balanced last year by a surge in Chinese lead exports. The regional imbalances seem to be returning this year.

Nickel

Tight fundamentals will help bulls rebuild

Nickel had an unprecedented month as the historic short squeeze triggered disorderly market conditions that forced the LME to suspend trading activity for just over a week – the first time such extreme actions have been required by the exchange since the tin crisis of the 1980s. While the LME is working to restore order in nickel and rebuild market confidence – and as reviews have now been launched by the exchange itself and by a panel including the Financial Conduct Authority and Bank of England – nickel prices seem to be establishing a new equilibrium above $30,000 per tonne as of early April. Beyond this technically driven correction and



stabilization process that will likely dominate the short-term activity, our price forecasts for nickel remain unchanged because the fundamental dynamics are essentially unaltered and still look bullish. We still forecast a global supply deficit of 93,000 tonnes this year, which means there is fresh upside potential for prices once the dust has settled over the short squeeze shock.

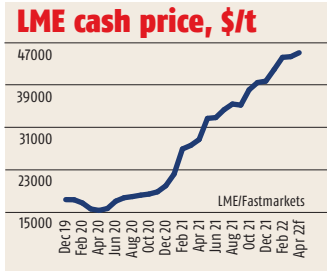
Fastmarkets MB

In this regular section, Fastmarkets MB's research team summarize their in-depth reports to highlight key factors driving the markets and their short-term price forecasts. The weekly service, Base Metals Market Tracker, provides independent analysis and forecasts for base metal markets and prices.

Tin

Uptrend expected to resume after consolidation

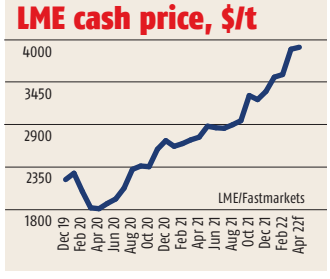
Tin prices have been stabilizing after surging past $51,000 per tonne and then experiencing a big sell-off in the first half of March. But, as with the other metals, tin's startling price fall was a reaction to risk-off sentiment after the LME suspended trading in nickel, not a reflection of any negative change in tin's fundamentals. In fact, we expect renewed upward pressure on tin prices given the persistent tightness in the refined market and the positive near-term fundamental indicators such as exchange stock outflows, backwardation and firm physical premiums. We believe the market remains in deficit, which should impact tin prices positively in the coming months. In addition, the macro environment is bullish for all commodities. And while tin tends to display the weakest macro sensitivity of all the base metals given its small size and relatively low liquidity, which limits speculative and investment involvement, some of the broad macro bullishness will also rub off on tin, lending further support to prices.



Zinc

Bullish themes still dominate sentiment for now

Zinc has been one of the base metals most affected by energy-cost inflation in Europe, as it has forced a number of smelter capacity reductions. The threat of further disruptions of Russian gas supplies to Europe continue to generate supply-side uncertainties and traders remain focused on this bullish narrative. LME prices have recovered strongly since the early-March volatility, rising from intra-day lows around $3,700 per tonne to test $4,400 per tonne in early April. And premiums have continued their surge that started in September-October last year when smelter stoppages were first announced, rising three-fold to $450 per tonne. While supply-side uncertainties remain, expectations of growing fundamental tightness will continue to dominate price sentiment. However, there is still a danger that at some point the risk of demand destruction caused by rising inflationary pressures could start to become more of a prominent concern and act as cap on price action, for zinc and the other base metals.



Analysis by **Andy Cole**, Fastmarkets MB

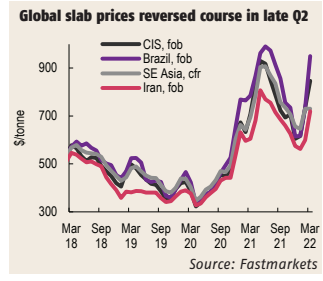
Steel

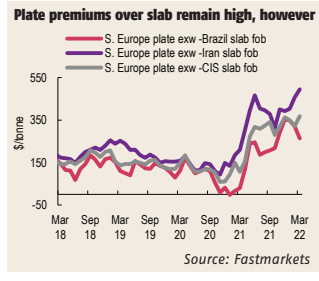
Global prices respond to effects of war in Ukraine

The invasion of Ukraine and consequential sanctions have resulted in shortages of slab globally, which, combined with reduced availability of raw materials and metallics as well as increased logistical constraints, has helped lift flat steel prices, especially in Western countries. The impact was the strongest on the European plate markets, given the strong role played by Southern European re-rollers – which typically would get most of their supply either from Ukraine or Russia.

The global market for merchant slab was thrown into turmoil in late February and prices surged through March and early April. While Russian steel semis have not been targeted directly, the removal of most Russian banks from the international banking system, measures targeting owners of Russian companies, combined with the risk of new sanctions going forward, have meant that many buyers are self-sanctioning and avoiding Russian cargoes if possible. As for Ukraine, although not all activity in the country has ceased, semifinished products would typically come from the Azovstal and Ilyich facilities in Mariupol, which have suspended operations.

The Brazilian slab export price climbed from $740 per tonne fob before the war to $1,250 per tonne in the week through April 1. Brazil now stands out as a key global supplier of slab that is not affected by the war or major international sanctions. This obviously makes it very attractive, but availability is limited, with May shipments already sold out. In 2021, Brazil accounted for 26% of global slab exports, with Russia at 38% and Ukraine at 12%. This leaves just 24% of exports to come from the rest of the world. Total slab exports reached 25 Mt in 2021, up from 22 Mt a year earlier.





Iranian prices rose from $615 per tonne fob before the war to $800 per tonne in late March, a more limited price rise given the restricted number of buyers for this material.

We understand that China is gearing up to ship slab to Europe to fill some of the supply gap. Exports have traditionally been close to zero (the country is a net importer), but these are reported by traders to have risen to 300-400 kt in the period since the war started. European buyers are also turning to Brazil as well as India for extra material.

The European plate market is under particular stress due to the drop in slab imports from Russia/Ukraine. Domestic plate prices were up by ▶

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76-81% month-on-month since the start of March both in Northern and Southern Europe, reaching €1,825 per tonne and €1,725 per tonne, respectively.

Rerollers in Belgium, Denmark and Italy are heavily dependent on slab imports from Russia and Ukraine to feed their plate mills. Italy, for example, imported 2.19 million tonnes of slab in January-November 2021, according to customs data. This included 1.76 million tonnes from Ukraine and 430,000 tonnes from Russia. Altogether, Russia and Ukraine accounted for as much as 93% of the EU's imports of slab over the same period.

Plate mills are seeking alternative supplies from India and Indonesia, but the market will take some time to adjust, and immediately available tonnages are limited.

The war and sanctions sent energy prices soaring, making a further dent into mills' margins, although costs still remain well covered. The initial sanctions by the EU did not target steel and raw materials directly. However, European steelmakers were either reluctant to deal with Russian suppliers or were facing difficulties conducting business with them, as European banks are not issuing Letters of Credit for Russian-related business. Deliveries from Russia's Severstal were halted after the EU imposed sanctions on its majority shareholder. On March 15, sanctions were tightened, and deliveries from Russia of products already facing tariff-rate quotas – including HRC, CRC and HDG – were banned. Russia's quotas will be distributed to other countries.

Analysis by **Kim Leppold**
Fastmarkets Research

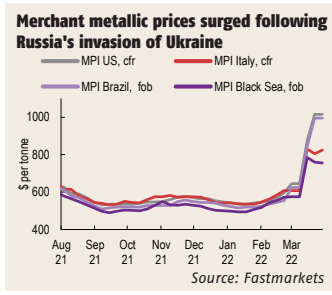
Steel raw materials

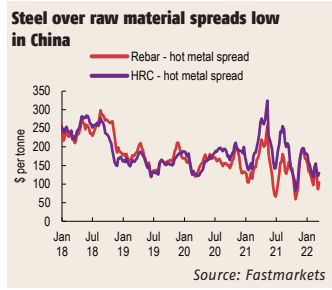
Covid-19 and conflict reshape the markets

Two key factors affected steelmaking raw materials markets in March. The first was the invasion of Ukraine by Russia, which has most noticeably driven up prices in the merchant metallics and scrap sectors. The second was the sharp rise in Covid-19 cases in China, which has seen several significant cities placed into lockdown and kept a lid on iron ore and Chinese coking coal values.

Indeed, the conflict in Ukraine has effectively curbed supply from two leading suppliers globally of merchant pig iron (MPI) – Russia and Ukraine – while the third major supplier, Brazil, has benefited amid the rapidly tightened market. This saw merchant pig iron prices into the US – usually the largest importer of MPI – surpass the $1,000 per tonne cfr Gulf of Mexico last month, a record high, while export prices from Ponta Da Madeira in Brazil rose by over $350 per tonne in the space of just a few weeks.

In contrast, European import MPI pricing developments have been choppier, with Italy, along with Turkey, picking up Russian MPI shipments lately, according to reports. This comes in part as, unlike for the US, there is no other prominent supplier that can quickly move volumes into Europe, such as Brazil, especially for material that would arrive fast enough to make up for lost Black Sea volumes. In turn, European prices have remained below those into the US, while Black Sea export prices have also remained below those from Brazil *(see chart)*.





Meanwhile, scrap prices globally have been driven up by surging prices into Turkey – the leading importer globally – where mills are securing material. This comes as Ukraine and Russia are competitors in the export steel markets, and in turn, with the conflict, both states have seen their steel export opportunities curbed, while Turkish mills have stepped into the void – leading them to require high scrap volumes. This saw the global benchmark Turkish import HMS #1&2 (80:20) hit a record high of $663 per tonne cfr in mid-March, and it hovered around the $650 mark in the latter half of March.

For the iron ore market, Covid lockdowns in China have been somewhat of a bearish factor for prices recently. Particular problem areas have included the manufacturing hub of Shenzhen and the leading steelmaking city of Tangshan. Most steel mills in Tangshan city are maintaining normal output levels, but they have reported significant problems with logistics, including deliveries of iron ore by truck and shipments to customers. Last year, the city produced 131 Mt of crude steel, accounting for 13% of the country's total.

In turn, amid the various lockdowns, blast furnace utilization rates fell slightly as the month came to a close, even though they were already at a low level compared with the same time last year. Rates fell to 85.4% in the week ending March 25, down from 85.8% in the previous week, according to Steelhome data. Typically, low (by Chinese standards) blast furnace operating rates suggest limited iron ore demand. Meanwhile, iron ore port stocks hovered around close to four-year highs during the month, further emphasizing limited consumption at mills and keeping prices cool.

The presence of Covid-19 lockdowns in China has also helped to dampen potential rises in Chinese steel values. This has seen steel over hot metal spreads in the country for both rebar and hot-rolled coil, which are well below long-term averages, suggesting that steel mills are facing pressure, even with Chinese coal prices low by global standards, while iron ore has not risen significantly – and is nowhere near the $200-plus mark it was in parts of 2021 *(see chart)*.

Analysis by **Alexander Kershaw**
Fastmarkets MB

FLACK GLOBAL METALS

Jeremy Flack

‘Our business case is about protecting capital’

Flack Global Metals CEO, Jeremy Flack, is a vocal proponent of using futures and options for price risk management in the steel supply chain. He told Richard Barrett about the strategy behind FGM’s complementary mix of physical steel supply and financial services, how he entered and has prospered in the steel business, and what it takes to succeed as an entrepreneur

As a young man growing up in a very small town in the United States in the 1970s, Jeremy Flack developed his first interest in business despite there being few local role-models to draw on. “There were few businesspeople around me. I was fascinated by it, but I didn’t know what it was,” he said.

That early fascination led to him study finance in college – he is a cum laude graduate of Miami University with a bachelor’s degree in finance, and he holds an MBA from Cleveland State University awarded in 1998.

Some early turns in his career saw it become interwoven with the steel industry. “When I started working at PNC Bank [in 1992] after college, I was an analyst. They gave us a project, which was to study this thing called a mini-mill: What is it? What is the impact going to be on the integrated steel manufacturers in the United States?”

The long-established Pittsburgh bank lent money to traditional steel manufacturers. Flack recalls that back then they really were not sure what mini-mills, championed by steel producers like Nucor, were about.

“We did the study and report and gave that to the credit committee at the bank. So, I learnt a little about the landscape and history of the steel industry in the United States,” Flack recalled. Living in the famous US steelmaking city of Pittsburgh gave him a further framework for his growing early interest in the industry.

“We are all products of our environments to some degree,” he noted. “My environment early on exposed me to the steel industry. Otherwise, I didn’t even know that it existed. How would I have ever known?”

‘I walked into this industry and thought it was so wasteful – there was no business certainty here, there was no predictability’

The next project saw him assigned to the real estate division of the bank, where he was a young commercial lender from 1992 to 1995. “The Chicago Board of Trade wanted to build a new trading floor in Chicago. It was going to be a very expensive project with a suspended floor between two buildings, over a city street, and they wanted to borrow the money to do it,” said Flack.

To make the loan, the bank had to understand the credit profile of the Board of Trade, how it made money, including earnings and cash flows. “I veered off in wanting to understand the history of the Board of Trade, and then I wanted to understand what futures and options are. So I took a detour on my own and started learning about what they are, just out of curiosity,” Flack recalled. That knowledge gained was to take center stage later on in his career. ▶

He left the bank and became chief financial officer and treasurer of Encore Manufacturing Corp. in Cleveland for a couple of years, before he entered the steel industry in 1998 by joining Lawson Steel, a small distributor.

"I was looking around, and there was no hedging, and the mini-mills had pretty well taken over the industry at that point and had made a big dent in integrated steel production. They had really catalysed change," he recalled.

"I got into the steel industry, and I thought 'Oh my gosh, here is this massive commodity business, that has seen enormous change and there is no hedging'." That was a realization Flack sees as a key root of the later founding of FGM.

"I walked into this industry and thought it was so wasteful – there was no business certainty here, there was no predictability. And there also wasn't nearly as much volatility then."

Looking back, he questions whether the steel industry actually needed to hedge in the late 1990s. "Things moved around so slowly. It probably wasn't a primary necessity back then. But that is where the beginnings of the FGM business model started from."

He said that realization that the steel industry did not hedge "was a huge lightbulb moment for me," adding that "It is not really a commodity, but it prices itself like a commodity."

China changed everything

The next big revelation was China. "When the Chinese market got big enough and influential enough in the steel industry to really start driving the global discussion, that was an incredible lightbulb moment," said Flack.

China's growing involvement in international steel markets would fuel the biggest volatility that had been seen in steel since the 1970s, he recalled, and it would be a point at which all the rules were going to change. "The market wasn't going to revolve around the US anymore. The market was going to revolve around Asia, and this was going to drive volatility because the US was steel short," he said.

He remembered thinking, "I have been working for a distributor in an industry that is dependent on foreign steel because there is not enough domestic production to make enough for all our flat-rolled consumption here in the US."

"Now I'm five or six years into my career when all this massive volatility comes from China, and it just doesn't end. It continues forward through the early 2000s. Of course, we ride the financial crisis, there is enormous volatility in commodities business, no hedge exists yet, and there is lots of pain and destruction in that period."

The idea thus emerged to Flack of creating a steel distribution company that would be out front on the risk management side of the business and combine the physical with the financial together.

Not everyone agreed with the merits of the idea at the time. Naysayers posed difficult questions: "Who in their right minds would start another service center in 2010? Why do that?" Flack recalled that at the time there were plenty of conventional distributors. "More distributors than anybody needed. Fighting tooth and nail is a cliché, but chewing each other to pieces in trying to get business because there was too much supply and not enough demand," he added.

Further headwinds were pointed out to him: "'You are starting a business in a recession. You are starting a business in an oversupplied industry. You'll never make money, and you'll never succeed. This will never work.' That was the feedback I got from banks and counterparties in the industry. Just about everyone gave me feedback that this was a bad idea," he said.

'I wanted to be someone who contributes to the industry – not just someone bobbing along in it'

"But we tried it anyway. Because fundamentally it made sense that hedging and steel should be linked, and that that linkage would occur, and I had discussions with the LME and Nymex in the early 2000s. I knew that hedge development was being rolled out in late 2008-09 during the recession."

By the time Flack decided to launch FGM in 2010, he had become co-owner, president and treasurer of Lawson Steel, but he divested his interests in Lawson to establish Flack Steel. "I became an accidental, reluctant entrepreneur!" he recalled.

He pointed out that the big personal decision to back his own instinct is an illustration of his own character, but one that he doesn't see as unique. "I think that is a familiar story in the US. I don't think it's an unfamiliar one. You have an idea. You think it can work. I am a natural risk taker. I have a very high tolerance to risk and pain. I can handle it and I thought that if I didn't try it – I was 39 years old – I'd have been okay to have made a little bit of money. But for me to bob along wasn't an acceptable outcome for me personally. I needed to make a mark. I wanted to be respected in the industry someday. I wanted to be someone who contributes to the industry – not just someone bobbing along in it."

Structure and strategy

"Our business case is about protecting capital. About risk management – commodity price risk management. Look at the FGM business model, and the guts underneath it, not necessarily on the exterior but on the interior, it is about protecting capital."

That comes against a backdrop of a steel industry where there has been a lot of waste, he added. "It lends itself to consolidation. I don't know if that has contributed to the

volatility, but I think structurally, if you look at the business in the US, the industry is the most volatile steel market in the world statistically. And it is also the only first-world, or G7, economy to be 70% EAF production of flat-rolled, heading towards 80% of production of flat-rolled."

He added that while Europe and China also have mini-mills, integrated steelmaking is still dominant in both locations. "There will be more mini-mills, but the US is way out in front of other developed economies with EAF-based steel manufacture," he noted.

Flack said that steel price volatility in the US makes the case for FGM's business model. "We are all about hedging out that volatility and creating durable earnings predictability," he said. "These structural changes point to greater volatility, not less. Some might say, 'Well there is consolidation so there should be less volatility,' but I don't know that the two meet each other. I think consolidation is a result of mismanaged businesses; why combine if you're doing great?"

Flack noted that there were about 25 steel-production companies in the US when he started over 20 years ago, and now there are six. "A lot of that consolidation came from companies that were not doing well. They were not financially well," he recalled.

"And now you have a financially sound mill business in the US, which you didn't have 25 years ago. So, the steel mills have managed to create a structure in a market where they are financially sound." He said that a variable overhead manufacturing structure within the mini-mill business contributes to that structure. "If scrap goes to 200 dollars [per ton], you can sell coils for 500 bucks. If scrap goes to 1,000 bucks, you're selling coils for 1,600 dollars. So they can move with the input and protect their business," he elaborated.

'This market is going to go on some wild rides, and it is going to change minds'

While 30 years ago the US steel sector had a fixed-cost business, now it is a variable-cost business, Flack added. "You can make steel in the US as efficiently as anywhere in the world and, because we are surrounded by water and we have great waterways internally, logistics are very good. So it is a great place to make steel."

He said the natural hedgers are the steel mills, the distributors and the OEMs. "The steel mills have said they are not that interested in it, so that leaves the OEMs and the service centers, for which we are in front of that discussion. We have the most sophisticated capital markets desk in ferrous in the US," he declared. "It is all designed to deal with this volatility that we believe is embedded now in this market."

"Look at the trends, look at the demographics, look at the industry and how it is setting itself up and we have lined ourselves up with," he added. "At this point our strategy is to follow along because this market is going to go on some wild rides, and it is going to change minds."

He said that global events over the past two years, including the Covid-19 pandemic and the war in Ukraine, recent thoughts that raw material supply chains around the world will be forever altered, and the idea of the nationalization of commodities, changes the game: "It creates more volatility, not less."

He added that FGM's strategy is to look around and support the market. "We want to support our customers. We want to support the growth of the futures and options markets in steel and the ferrous complex… What we're really trying to do is change buyer behaviour and have an option for them to express risk management ideas and easy access and conduit to the marketplace."

He said FGM believes that global macro trends will "caven the community down to a belief that everyone should be engaging in price risk management in their supply chain. Everyone should be taking that price risk and minimizing it. We build a supply chain and we do price risk management, so for us it's 'let's just follow along, let's incrementally create products and services that will support the community as it gravitates towards this inevitability,' which is that CEOs and CFOs of companies don't like it when their raw material price whips all over the place and they cannot plan their business."

"This is going to create a positive environment for change, and we want to be part of that," he summarized.

New products and services

When Flack spoke with *Metal Market Magazine* in November last year about FGM winning the award for Ferrous Futures Trading Company of the Year in the Fastmarkets Global Awards for Steel Excellence, he mentioned that two of the company's priorities for 2022 are to launch Metal Bank Structured Transactions and to build its hot-rolled coil market-making desk, and market-making book. A carbon trading desk is a third priority.

"When we introduced the concept [of the Metal Bank Structured Transactions], we weren't ready to hit the market yet. We hadn't finished the term sheets and all the legal [aspects] behind everything. That has now been completed. So we are in a good solid position to go forward," Flack updated.

FGM has hired Keith Shuttlesworth, who was formerly the chief commercial officer for Big River Steel, as executive vice president of FGM's Metal Bank. "We've now brought Keith in to run the Metal Bank Structured Transactions products," said Flack, noting that FGM is in discussion with several potential customers for the product.

Flack said that it is a challenge to roll a new product into the market and that a particular challenge for FGM is that some OEMs see FGM as a steel distributor, and not a financial services company. "So the tendency is for us to get into the supply chain people and not into the C-suites. Really this Metal Bank product is a C-suite product to be consumed by the C-suite. Certainly, the supply chain people need to be involved, but you need to have both there," he said – interlocking his fingers to stress the importance of their combined input – "One cannot do without the other."

He said that FGM is getting a quick education in rolling out a financial services product as a physical player. "That is why we created the Metal Bank moniker, so that we can try to connect with the financial people inside OEMs and have them see us for a financial services company. Yes, we have a distributor arm and we do supply physical – but we want to put forward this idea that as much as we are a physical distributor, we are a financial services provider as well." That challenge right now we are working through.

FGM is hiring another expert for the market-making desk and is bringing additional talent onboard to launch its environmental desk starting in April, trading both the voluntary and compliance carbon markets. "We are also going to wrap carbon offsets into our steel and aluminum products in order to help our customers offset the carbon footprint etc.," Flack added.

He said that FGM continues to work on the physical side of the business, because the company is still a physical distributor. "We are working on developing a service center in Houston. So I would say that we are 80% along the way with having a physical presence in Houston, which we hope to announce officially later on into April," said Flack.

FGM announced last November that it had become a member firm of the CME Group. Flack said the benefits of membership are working very well for the business. "We have been a vocal proponent of the CME and of HRC futures for 12 years, so to be a part of the CME Group, a participant member, it drives collegial [support] and bonding to the market and gets us closer to the market than our competitors," he said.

Entrepreneurial spirit

Asked what advice he would give a young recruit about how to succeed as an entrepreneur, Flack initially said, smiling, "I think we all sometimes wonder how did I get here or what am I doing!" But he followed up with clear views on the ambition, drive, determination, persistence, resilience, and willingness to take risks and work long hours that are needed to achieve success.

"I've been willing to do things that others aren't. I've been willing to get to the office as a young person in the business two hours before everyone was there, and two hours after everyone left – week in, week out; month-in, month-out; year-in, year-out," he said. "I have also aligned myself with like-minded entrepreneurs, like Ben Bucci, FGM's President, who joined FGM when Flack Steel and GlobeNet Metals merged in 2013. Since then, Ben and I have made all our decisions for this business together."

"I think that if you really want success beyond general career growth, and something big, it takes way more than eight hours a day, five days a week. It takes dogged determination and I think you do have to have an appetite for risk. You have to have an appetite to take a chance to fail, and to learn from your failure and you need people around you who share this affinity for risk. You've got to have an outlook on failure that says 'I'm learning from this. Yes, it's horrible, but I'm going to learn from this and work my way out of it.'"

'If you are going to commit to an industry or to a business and you really want to make an impact, you need to be willing to do more than everyone else around you'

Like many businesses, he said that FGM has faced challenges over the past 12 years that he and his team have had to work through. "So, learning from those experiences and realising that it is okay and that there is usually a way forward, and being willing to put in whatever time it takes to be good at something," he added.

He said the Japanese say that it takes 30 years to become a master, going through various levels of mastery. "If you are going to commit to an industry or to a business and you really want to make an impact, you need to be willing to do more than everyone else around you," he said.

"I see a lot of hard-working people in the world. But you have to be a bit obsessed – and I don't know if that's healthy, he smiled. But if you're asking me what it takes… I have been dedicated to my work and it has been the most important thing to me – sometimes more important than my family."

He realizes the gravity of such dedication to work and added "I'd say you look around you, make sure you have support around you and that you have family support. Make sure that if you want to be an entrepreneur, you have a partner or a spouse, or mother or father, or children who understand that is how it is going to be."

He also said that if it were not for the unwavering support he has gotten from Bucci and others at FGM (many of which have been with the company over 10 of the company's 12 years in operation), he likely would not have made some of the bolder moves he has made over the years. "I do nothing and have done nothing alone," Flack stated.

He recognized that not being home from work at the same time every night, or not always being available to play with your children is not acceptable

to many people, "but you have got to ask those questions if you get into entrepreneurship, because entrepreneurship is all-consuming if you're going to be successful," he re-iterated.

Flack pointed to the unwavering support of his second wife. "I would not be on this conservation with you if it were not for the support of my wife – there's no way. There's no way I do what I do without her – absolutely no way. She is not making any decisions about the business. She's not helping me plan the business. She is not involved in the company. What I mean is the support I get at home is unwavering, it is complete, and she is willing to sacrifice for this to work. And she knows that her support ends up helping everyone here as well."

Flack added that he thinks a lot of people dip in [to trying to be an entrepreneur] and then think, "'Oh my god, I never thought it would be this hard,' and then it's a problem, because when it gets hard, you have to work harder and when it gets even tougher, you have to dig even deeper."

In his view, successful entrepreneurs often do not get the credit they deserve because people look at some of the wealthiest and think they now have it easy, while forgetting or being unaware of the time, effort and determination they put into achieving success.

"Look at the result and we either revere it or we hate it… But what these people had to do to get where they got to, those are the forgotten stories that are not really told, and I think that there are a lot of heroes in this country that are entrepreneurs. They are heroes because they create places where people can come… Things are changing. People look at their job and their workplace and this is really where they find community and find one another – I know we have this at FGM."

'We are really trying to be the next evolutionary step in the way that the industry deals with risk and with the supply chain'

"Entrepreneurs – not all of them are good and not all of them are bad – do in this country create a place and create a positive movement, for careers, for growth, for personal growth, for values. I think the entrepreneurs in this country are great unsung heroes," he added.

Flack also said that the opportunities he has had to progress have been nurtured by the US democratic system, spirit and way. "The more that I think about the world that we live in globally, the more respect and admiration I have for the system we have in the United States. The American Dream is not dead," he declared.

He noted that some people in America talk the country down and say that the opportunities are no longer there, or that capitalism is bad, "but I think one of the principal reasons that I'm here is that, as a child, I heard about this thing called the American Dream."

If you are willing to take the risk the system works, he said. "If you are a little lucky and are very good and very dedicated and have the right mixture of things, you can get it done in the United States. The path has been available to me because of the country I live in."

"So we're here and we are successful. We have 60 professionals that make a nice living, support their families and grow their lives and do their thing in the United States. I think that the biggest reason that we are here is that it allows for us to be here."

FGM's mission

Flack is aware that some steel industry participants have a residual fear of, or dislike, the influence that trading steel on futures and options markets may have on the physical supply of steel. He is also aware of the broader general concerns that some have about innovative 'disruptive' enterprises squeezing out smaller players in other business sectors. FGM has its roots in both the physical and financial worlds and Flack is keen to reassure them about his firm's mission.

"We're trying with this company to support the industry. The industry has been treating itself as a zero-sum game, but it's not. With our leadership, help or involvement – whatever it is – we're searching for all ships to rise on the tide. Everybody wins outcome," he said. "And we want to be part of the solution. We are not disrupting the market. We are not a disruptor. We're not looking to change it in a way where we are looking to vanquish all competitors. We are really trying to be the next evolutionary step in the way that the industry deals with risk and with the supply chain."

He said that he stresses those points because he thinks that Flack Global Metals' mission has been misperceived by some in the steel trade and industry, when in fact he says that "It is to provide certainty – that's what the business is here for. That is the model. That is everything we do, whether we're supplying the physical steel or simply helping you hedge your risks out. Whatever entry point we have with a vendor or a customer, it's all positive."

He thinks there are still some people in the industry who are sceptical and scared. "I get that, but really it's a movement for good, a force for good and a force for stability. And when you talk about business and business valuation, it sustains a business's life."

"Many are searching for stability and certainty and that is what this business is designed to do," he stressed. "We just have that as a primary activity. I'm really becoming sensitive to this fear that is out there. It is not really founded in anything. It's really 'If I don't understand something then I am going to fear it.' And we have a lot of happy customers who come back again and again because we are seeing good results!"

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ANSWER 02

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DANIELI GREEN METAL

China aims to tighten its grip on iron ore supplies

Since iron ore supplies and prices are of fundamental importance to China's enormous integrated steelmaking capacity, the country's government takes a close interest in them. Norman Fong reviews recent initiatives taken by China's authorities to boost domestic production, influence trade and limit price surges in the vital raw material

GETTY IMAGES

As a critical raw material for China's vast steelmaking industry, and by extension the country's economic growth, the nation's government is using multiple levers to secure and control supplies

China has shored up efforts to manage the iron ore industry in the past few years, with a broad two-fold focus on cooling rocketing iron ore prices and enhancing domestic supply resilience for its steelmaking needs.

Steel production has not only been vital to China's economic growth as one of the largest industries in terms of revenue, but downstream finished steel products are also heavily utilized in sectors crucial to China's growth – manufacturing, infrastructure and building construction.

"The broad-ranging impact of steel product supply and steel prices on major sectors of economic growth in China render it a strategic national interest. By extension, it is crucial to keep the prices of steelmaking raw materials relatively stable and economically viable," according to a mill source based in Beijing.

Infrastructure investment has been a lynchpin to China's economic growth, with infrastructure spending ranging high between 5 and 7% of China's GDP. Increasing costs of building materials such as finished steel products threaten the viability of existing projects.

Prices of iron ore, the predominant component in steel production, are thus keenly scrutinized by the Chinese government, said a Xiamen-based trader source. The trader added that the heavy reliance on iron ore imports exposes the Chinese market to price fluctuations in the international seaborne market, which are complicated by price movements in the derivatives market. It is thus paramount from the Chinese government's perspective to cap price surges in iron ore, which it has increasingly looked to achieve in recent years.

Enhancing state influence

Chinese authorities have previously sought to temper sharp hikes in iron ore prices through a series of advisories issued by the National Development and Reform Commission (NDRC) and the China Iron and Steel Association (CISA) cautioning against price speculation in the iron ore futures market and stock hoarding.

"The stern warnings from the NDRC had the effect of cooling down rocketing prices in the futures market on the Dalian Commodity Exchange (DCE) as speculators momentarily receded from their positions for fear of punitive action from Chinese authorities. The impact of these efforts was successful in the short run. However, market prices would be driven up by price surges in the futures market a few months down the road," according to a trader source based in Singapore.

In February 2022, Chinese authorities adopted an unprecedented slew of additional measures in response to price surges in the iron ore market, signalling the determination of local authorities to stabilize iron ore prices. Beyond the issuance of official warnings against market speculation and portside stock hoarding, the NDRC issued notices to a ▶

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number of large trading houses to meet up with local authorities.

"Representatives from the trade houses were told to have their trading logs and port inventory numbers ready for declaration. This was an unprecedented move that prompted many market participants into laying low for the time being at the risk of being subjected to further regulatory oversight," according to a Shandong-based trader.

Beyond meetings with major trading houses, the NDRC also sought to enhance regulatory presence in Chinese ports. The NDRC met with domestic port operators to explore measures of shortening existing free storage periods of iron ore for traders so that they would shy away from hoarding.

"The various meetings by the NDRC with the port operators as well representatives from the DCE was a visible step-up from its previous approach and this injected an increased level of uncertainty about further government intervention. Iron ore prices visibly retreated from their previous rally in response to these enhanced measures," a trader source based in Singapore said.

Nonetheless, some traders remain sceptical about the long-term effectiveness of these interventions.

"Government intervention on iron ore prices is only able to suppress market prices in the short run. One can easily observe how iron ore prices behave in a cyclical fashion over the years – they trend lower after various interventions from the government and begin to spike up a few months later, riding on bullish sentiments in the market," another trader source in Singapore said.

Controlling supplies

Other traders are more optimistic about the longer-term strategies adopted by the Chinese government to control iron ore supply. "Expanding domestic ore production can enable steel mills to have alternative supplies of iron ore, especially when seaborne prices trend upwards, insulating the costs of steel production from external fluctuations," according to a trader source based in south China.

In a bid to reduce China's reliance on iron ore imports and minimize the country's exposure to global iron ore market fluctuations, the Chinese government announced plans to promote the development of domestic iron ore mining projects and iron ore reserves.

In early March, CISA laid out a specific 'cornerstone plan' in charting out the expansion of iron ore output. The plan aims to increase China's iron ore output to 370 million tonnes in 2025 (up from 270 million tonnes in 2020).

The announcement by the Ministry of Natural Resources of China to develop 25 large-scale iron ore mining projects and 28 state-level mining areas was a strong signal by the government of its interest in boosting domestic supply resilience as well as to wean China off its heavy reliance on iron ore imports, a Singapore-based trader source said.

Some traders were sceptical about the short-term benefit of this strategy. "It is without a doubt that the measures to boost domestic ore production shores up China's iron ore supply security. Nonetheless, one must not underestimate the dependence of the Chinese market on overseas fines. Australian iron ore imports will continue to occupy a sizeable market share in the Chinese market up till the end of the decade," another Singapore-based trader said. The trader acknowledged that other measures beyond boosting domestic supplies are required to fulfil the goal of price stability.

Some traders are expecting the emergence of a previously announced centralized trading platform to allow the Chinese market to win back greater control. "A common trading platform between the mine majors and Chinese buyers will be able to level the playing field between buyers and sellers and allow for domestic market fundamentals to be more accurately reflected in the seaborne market," according to a Shanghai-based trader.

In late February, the NDRC announced that it is seeking to establish a single, state-backed platform for iron ore procurements. The proposed centralized platform will allow iron ore suppliers to negotiate deals directly with domestic buyers.

While fundamental details of the platform and its operational model remain to be announced, market participants remain split in their reaction towards centralizing market trades. Some iron ore market participants are expecting the platform to be rolled out as soon as the third quarter of the year, citing the government's renewed resolve in stabilizing iron ore prices.

"The increased presence of the NDRC on the iron ore market is a signal to many market participants of the government's determination in stabilizing prices. Establishing a trading platform will be able to consolidate the government's efforts in managing price surges," according to a Singapore-based trader.

"It would be easy for the proposed platform to leverage on the existing capacities and contact base of the state-affiliated Beijing Iron Ore Trading Centre Corporation (COREX). Instead of establishing a separate platform which would possibly require a longer lead time, COREX can take on a broader set of functions," according to a Xiamen-based trader source.

Most market participants remain uncertain about the establishment of the trading platform. "There is a fundamental difference between the seaborne and the domestic portside market due to the presence of a large time lead in cargo shipping. Negotiated prices at the Chinese ports are based on cargoes with short loading notices in contrast with the seaborne market whereby negotiations are made on cargoes with longer laycans. Establishing a common trading platform capable of synergizing these differences would be a challenging feat," according to a trader source based in Singapore.

At present, there are various concerns about the potential establishment of a new platform. A main concern would be whether the platform would be conducting trades in Chinese Yuan or in US dollars. "Another factor to account for would be whether the Australian and Brazilian mine majors would be amenable to trading on a centralized, highly-regulated platform," according to a trader based in northern China.

Regional iron ore suppliers were also sceptical about the eventuality of a centralized trading apparatus. "Barring the lack of details on the platform as of now, we still think that the fundamental concept of a willing buyer and willing seller still applies. If the trading terms established on the platform veer too far from a regular competitive market, producers have the option to sell their product to other buyers in other markets," a seller source from Australia said.

Supplies and prices for a vital commodity that is iron ore remain a critical part of Chinese government strategy, particularly in a period where economic recovery remains a priority. Beyond the adoption of short-term domestic market interventions, the success of China's longer-term measures in insulating its iron ore market from the overseas market remains to be seen.

Multiple objectives for India's steel producers

Buoyed by high steel prices, growing domestic demand and national governmental policies, India's steelmakers are pressing on with plans for major capacity expansion, reports Kunal Bose

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Demand for construction in India is driving investment in long-product mills

Indian steel majors have five distinct objectives. First, build new capacity rapidly with the best available technologies through brownfield and greenfield routes, making optimum use of land. Unused surplus land with mills is useful for capacity expansion. This was a prime consideration for healthy steel groups to bid aggressively for financially ailing steel companies that recently came up for auction.

For example, in explaining the recent acquisition of the government-owned majority stake in Neelachal Ispat Nigam's 1 million tonne long-product mill in Orissa for Rs121 billion (about $1.6 billion), Tata Steel CEO and managing director T V Narendran said a compelling reason for the purchase was the unit's ownership of 2,500 acres of land, of which most is unused. This would allow "us to take its capacity to 5 million tonnes in the first stage and finally to 10 million tonnes."

Secondly, steel majors are being pushed by the government in New Delhi to "fulfil the country's growing demand for high-grade automotive, electrical and special steels and alloys," as part of prime minister Narendra Modi's Aatma Nirbhar Bharat (self-reliant India) programme. Much of India's imports of 4.75 million tonnes of finished steel in 2020-21 consisted of very-high-value products for which local capacity is largely missing.

Thirdly, the new mantra of steel producers is to have strong balance sheets by reducing debts quickly, taking advantage of prevailing high metal prices and achieving an ideal debt-to-equity ratio. For example, Steel Authority of India Limited (SAIL) substantially reduced its debts from Rs353.5 billion in March 2021 to Rs191.3 billion in December 2021. SAIL chairperson Soma Mondal said: "We are spearheading actions to rapidly bring down our borrowings. Debt management is given high priority. We shall stay this course to embark on our next phase of expansion with confidence."

Debt management resonates with other leading groups. For example, Narendran said: "We are rooting for healthy financial ratios. We have brought net debt to Ebitda to below 1. Having a comfortable net debt to Ebitda ratio is a prudent goal to pursue [rather] than looking at an absolute debt target. In any case, our net debt would have been further down but for a recent acquisition." As steel price rises are more than compensating for increases in coking coal and iron ore costs, the industry's Ebitda is rising quarter on quarter. That is aiding debt reduction.

JSW Steel, which is to lift capacity to 35.5 million tonnes per year by 2024-25, from the present 26 million tpy, and at the same time enrich the portfolio of value-added and special steels, has a "net gearing and leverage well under the stated caps of 1.75x and 3.75x." The combination of high levels of cash generation from business and good credit ratings will underpin comfortable funding of the group's expansion programs at multiple locations. The financial difficulties encountered by a number of steel producers in the industry, including Essar Steel, Bhushan Steel and Bhushan Power & Steel has made others in the business careful about their own borrowings. However, the strong contests among bidders acquiring the assets of India's ailing steel companies have highlighted their value.

"Health of the steel industry, which has a share of 2% of the country's GDP, has not been this good in a long time. It is, therefore, well placed to pursue the government-

given capacity target of 300 million tonnes to meet the anticipated crude steel demand of 255 million tonnes by 2030-31," said Indian Steel Association secretary general Alok Sahay. Dominant industry groups have regained financial muscle to commit big investments in capacity building, he said.

In the fourth objective, the industry, which has a share of 12% of India's carbon dioxide emissions, has been nudged by the government to employ "best environment management practices" for "rapid reduction of its CO_2 footprint." Tata Steel, JSW Steel and ArcelorMittal Nippon Steel (AMNS), which bought Essar Steel's 10 million tpy mill in Gujarat in December 2019 under the insolvency resolution law, are all committed to achieve carbon neutrality through progressive reduction in emissions.

At the same time, the operations of a large number of sponge-iron units and induction furnaces (IFs) in West Bengal and Jharkhand is causing environmental concerns. Local governments need to come down hard on those in the way that China has done with its errant steel mills, said an official of The Energy and Resources Institute.

As a fifth objective, digitalization and data analytics are increasingly being used in the entire value chain by industry leaders for improved operational excellence and better risk management. A Mines Ministry official said: "As digitalization takes root in downstream steel and aluminium making, we are telling merchant miners and also captive mine owners, of which there are quite a few, to digitalize their operation for cost efficiency, operational safety and a clean environment."

Iron ore mining

India's highest court suspended iron ore mining in Goa and Karnataka as mining leases were withdrawn in Goa and concerns raised about alleged environmental damage at some mines. That experience required governments of other major iron-ore-bearing states, such as Orissa, Chhattisgarh and Jharkhand, to have a much greater oversight of mining operation. Under court order, miners in Karnataka are not allowed to sell the mineral outside the state. Iron ore imports into the southern state are allowed, however, putting prices there under pressure.

Mining in Goa, which used to export 40 to 42 million tpy of iron ore, almost entirely to China, has remained shut since the court cancelled, on March 16, 2018, all of the 88 iron ore mining leases as their renewals by the state government were not found to be "fair and reasonable." The newly installed government in Goa, following March state elections, may move quickly to put the long inoperative mines on auction.

The iron content of ore mined in this coastal state is low at 55 to 58%, for which local demand is very low. Even if mining resumes, local miners are not sure how quickly they will be able to regain Chinese custom once ore extraction starts following auctions. Steel minister RCP Singh said: "The mining sector must be deeply conscious of its impact on the environment. Sustainable mining practices and conservation initiatives are the need of the hour."

With 2021-22 production at 244 million tonnes, iron ore is India's second largest mining industry after coal. The nation's 2017 steel policy says iron ore requirements will be 437 million tonnes in 2030-31, based on an assumption that 60 to 65% of steel production will be through the BF-BOF route and the rest through EAFs and IFs.

"Steelmakers here have the benefit of India holding iron ore resources of well over 33 billion tonnes. With this size of resources and our long mining tradition, the 2030-31 target, though it appears ambitious is achievable. But the government must bring speed in auctioning mines afresh once current leases expire. Simultaneously, new mines are to be opened with environmental and the host of other clearances coming quickly. On their part, steel mills must learn to use low-grade ore fines like their counterparts in China by way of beneficiation and agglomeration. We can expand out resource base through intensive and deeper exploration," said Federation of Indian Mineral Industries director general RK Sharma. But for this, the participation of foreign groups armed with state- of-the-art exploration technologies will have to be ensured by offering them the right incentives, said Sharma.

Singh has said: "We will definitely have 300 million tonne [steel production] capacity by 2030-31. In fact, my ministry is engaged in preparing the 'Vision 2047' document, targeting capacity build-up of 500 million tonnes. The secondary sector will have a share of 40% in that expanded capacity."

Endorsement of Singh's confidence is found in Narendran's observation that "in the post Covid-19 improved outlook for the economy, overall private sector investment is coming back with force. And this is led by the steel industry which already has announced investments of over Rs1,000 billion in new capacity building."

More steel investments are in the pipeline. For example, SAIL's Mondal is to take its capacity to 50 million tpy from 19 million tpy and in that it will have a considerable amount of "special and value-added products."

Sahay said: "besides the improving debt-equity ratio, the roll out of many large infrastructure projects, promotion of steel scrap recycling, reforms of mining sector and ease of doing business are giving confidence to the industry to grow capacity at an accelerated rate." No doubt, the industry will have capacity in excess of domestic demand from time to time. But Narendran said: "Our objective being to take care of domestic demand first, we keep our exports to 10 to 15% of production. But as you saw during the pandemic, if the situation so demands we know how to sell much larger volumes in the world market."

Ambitious expansion programmes announced by the industry are encouraging to consulting firms, heavy machinery manufacturers and civil construction groups. As owners of large unused areas of land at three of its five integrated mills, SAIL will not face space constraints in creating an additional capacity of 30 million tonnes.

The two recent acquisitions – Neelachal and Bhushan – and also surplus land at the company's Kalinganagar mill gives Tata Steel's Narendran confidence to say that "We can take our capacity to 45 to 50 million tonnes" from 19.6 million tonnes by 2030. While the Kalinganagar mill is being expanded to 8 million tonnes from 3 million tonnes, Narendran said "We can actually accommodate capacity of 25 million tonnes at 6,000 acres there." An ardent advocate of circularity in steel, he said "Tata Steel is deliberating on setting up a 500,000 to 800,000 tonne scrap-based steel plant."

The desire to benefit from a considerable rise in demand for long products, which will result from the country's focus on infrastructure development and house-building for the country's large population, led Tata Steel to buy Neelachal, and earlier Usha Martin's mill. Tata Steel will make long products via the EAF route.

While many groups have ambitious growth plans, AMNS is undertaking a particularly large program in building a 24-million tpy mill in Orissa in phases, using "green steelmaking technology" at an investment of Rs1,020 billion.

Non-ferrous metals giant Vedanta secured a toehold in steel by acquiring a financially ailing 1.5 million tpy long products mill in Jharkhand. Not only is it doubling that plant's capacity, but it is also to build a much bigger greenfield mill in the state.

New plant orders

A list of recently placed international new plant orders for new and upgraded plants, expansions, modernizations and revamps provides many examples of the application of the latest innovative technologies available from a range of leading suppliers

Customer	Supplier	Order Details	Start Up
Austria			
AMAG Rolling	Andritz	A new 30,000 t (gross) strip pickling line No. 2 in Ranshofen for HR and CR strip	Mid-2023
Voestalpine	Primetals Technologies	Conversion of continuous tandem line into 1.9 Mtpy pickling tandem line in Linz to optimize for HS and UHS steels and high-permeability electrical steel strip	End-2023
Belgium			
Aperam Genk	Primetals Technologies	New argon oxygen decarburization (AOD) production line to upgrade existing plant (includes dedusting system with provision for heat recovery)	Mid-2023
Brazil			
Gerdau	Danieli	Modernization of automation control systems for billet caster No. 2, and rolling mills No. 1 and No. 3 in Cosigua	–
Canada			
Algoma Steel	Danieli	Digimelter for transition from BF to EAF steel production in Sault Ste. Marie, Ontario. Capacity for 3.7 Mt of liquid steel with two 250t EAFs	Early 2024
Taylor Steel Inc.	Andritz	Herr-Voss Stamco cut-to-length line in Stoney Creek, Ontario, for 0.625in x 72in wide material with incoming coil capacity of 80,000 lbs	–
China			
Amer International Group	SMS group	11 new Contirod® copper wire rod plants for 8 mm rod for electrical conductor production	2022-2024
Fushun Special Steel (Shagang Group)	Danieli	New special-steel long-product mill to produce 8-98 mm bar, 5.5-25 mm wirerod and flats	–
Jiuquan Iron & Steel	Andritz	New pickling and galvanizing line for HR carbon-steel strip	End-2023
Sinosteel Engineering & Technology	Tenova HYL	Hydrogen-based 1-million tpy Energiron® DRI plant at Baosteel Zhanjiang Iron & Steel	–
Yukun Iron & Steel	Danieli	QSP DUE quality-strip plant for HR strip in thickness from 0.8 to 25.4 mm in Yuxi city, Yunan province	H2 2023
Yukun Iron & Steel	Danieli	9.7 Mtpy long-products project with 4 new casters (for 165 mm billets) and 7 new rolling mills	By 2023
France			
ArcelorMittal	Primetals Technologies	Two new LD converters (BOFs) in Dunkirk (one replacing an old converter and the other to hold on stock at site for later installation)	–
Celsa France	Tenova Goodfellow	iEAF technology platform using NextGen® System for 150t AC EAF top-charge furnace in Boucau	Late Spring 2022
India			
Arjas Steel	Danieli	Bar-in-coil line for alloyed and micro-alloyed smooth rounds from 13-45 mm dia in coils at a max. speed of 15 m/s	End of 2022
JSW Vijayanagar Metallics (JSW Steel)	Primetals Technologies	Two BOF(LD)-converters, two ladle furnaces, gas cleaning and dedusting systems, two slab casters for new 5 million tpy steel meltshop No.4 at Vijayanagar, Toranagallu for high-quality carbon steel	–
JSW Steel	Danieli	High-productivity straightening lines for rolled steel bars at Salem Works, running at up to 120 m/min	–
Jindal Steel Odisha Limited (JSPL)	Metso Outotec	Iron ore grate kiln pellet plant for 6 Mtpy of iron ore pellets	–

Customer	Supplier	Order Details	Start Up
Resources Pellets Concentrates Pvt. Ltd.	Metso Outotec	Technology for 432 sq metre indurating machine for travelling grate pelletizing equipment to improve iron content of ore	–
Indonesia			
PT Huafei Nickel Cobalt	Metso Outotec	Larox® tailings filtration technology for greenfield laterite nickel ore project with 120,000 tpy projected output of nickel metal	Q2 2023
Italy			
Acciaierie d'Italia, Taranto	Primetals Technologies and YARA Environmental Technologies	Flue gas treatment systems for three 160 MW boilers at power plant No. 2	Q4 2022
Cogne Acciai Speciali	Danieli	HGS200 EVO electric billet grinder to process special steel billets up to 200 mm square and 7.5 m long; also 220 x 270 mm blooms with max. length of 5 meters	Summer 2022
Hailiang Metal Europe	SMS group	Large 4-strand horizontal continuous caster for up to 150,000 tpy of brass extrusion billets with a diameter of 245-400 mm	H2 2022
Mexico			
ArcelorMittal	Metso Outotec	Grinding equipment (including Premier™ grinding mills) for Las Truchas iron ore project	–
Norway			
Boliden	Metso Outotec	Technology for Green Zinc Odda project, including roasting and off-gas cleaning solutions and a sulphuric acid plant; plus hydrometallurgical equipment and technology for calcine leaching, solid-liquid separation and solution purification. Zinc metal production capacity to increase from 200,000 to 350,000 tonnes	2022-2024
Poland			
ArcelorMittal	Danieli	New rail head hardening system to heat treat hot rails coming from the rolling mill (lengths over 120 m; weight 45-68 kg/m; hardness over 400 HB)	2023
South Africa			
Sibanye-Stillwater	Tenova Pyromet	Upgrade of PGM smelting furnace No. 1, including composite graphite-copper sidewall coolers	Construction starts Q2 2022

ArcelorMittal has chosen Danieli technology for an R&D project focusing on the production of premium-quality high-speed rails in Dabrowa Gornicza, Poland.

The project is designed to make it possible to deliver 120-meter-long head-hardened rails to the latest European and American standards in an efficient and environmentally friendly way. It is co-financed by the European Regional Development Fund.

The new rail-head hardening system will be able to heat-treat hot rails coming from the rolling mill with lengths over 120 meters, and a weight between 45 and 68 kg per meter, while achieving hardness levels greater than 400 HB.

DANIELI

The Danieli-patented technology chosen requires rails to be immersed in a non-toxic water-polymer solution that allows a flexible cooling treatment achieving homogenous mechanical properties over the entire rail length. The plantmaker notes that the process is energy saving, as no air blowers are used for quenching, and no additional heaters are required for head/tail temperature equalization.

It will provide an automated control system, with dedicated PLC and HMI. The project is due for completion next year.

New orders


PRIMETALS TECHNOLOGIES

German steel producer Hüttenwerke Krupp Mannesmann GmbH (HKM) granted Primetals Technologies final acceptance for two new 285-ton ladle-treatment stands, one of which is shown in the photo. The stands were built at the BOF steel plant at the Duisburg-Huckingen site. They are designed for 5.2 million tonnes of liquid steel per year in fully automated operation and are well prepared for further digitalization, notes Primetals Technologies. The plantmaker also explains that the use of copper-clad lids increases service life and ensures the quality of the steel produced. LiquiRob systems manage tasks such as temperature measurement and sampling, which were carried out manually in the past. The phosphorus content of the melts can be reduced and higher alloying percentages are now achievable.

The stands will be able to handle all melts produced in the two converters at the works. The resulting capacity of 5.2 Mtpy requires very high availability of the ladle-treatment stands, achieved by the high-quality copper-clad lids and a high-performance, high-current system, Primetals explains. Energy is supplied by the steel operation's own power plant, which converts the blast-furnace top gas and coke gas into electricity.

The main tasks of the ladle-treatment stands are: reducing refractory consumption of the converters by lowering tapping temperature by up to 50°C; reducing phosphorus content in the steel; producing melts that necessitate a higher degree of alloying; increasing the optional use of pig iron or scrap in steelmaking; optimizing the use of lime; and reducing the amount of slag. The arrangement of the ladle-treatment stands directly in the production line behind the converters and the very limited space available in this area of the steel plant required a complex layout with special portal design. Primetals Technologies was responsible for the process equipment and for installation and commissioning.

HKM produces over 1,800 different steel grades. With a production capacity of 5.6 Mtpy of slab and round bars, HKM is one of Germany's largest steel producers.

Customer	Supplier	Order Details	Start Up
Turkey			
Ege Çelîk Endüstrisi Sanayi ve Ticaret	Primetals Technologies	Upgrades to wire rod mill with new wire rod outlet and thermomechanical rolling to improve drawability	Summer 2023
Hekimhan Madencilik	Metso Outotec	Siderite calcination plant, including rotary kiln, cooler, and heat recovery and gas cleaning equipment for 600,000 tpy plant	H2 2023
USA			
Aurubis Richmond, Georgia	SMS group	Construction of multi-metal recycling plant for 90,000 tpy of complex recycling materials (circuit boards, copper cable, and other recycling materials to be processed into 35,000 tpy of blister copper (also to yield nickel, tin, zinc, precious metals and PGMs))	H1 2024
Grand Blanc Processing	Tenova	Roller-hearth type short-time-cycle (STC®) 26-tonne furnace for wire processing facility in Holly, Michigan, to spherodize anneal and stress-relieve high-quality wire products	–
Li-Cycle North America Hub	Metso Outotec	Mn, Co and Ni solvent extraction technology, including 3 modular VSF®X solvent extraction plants, for a battery recycling plant in Rochester, NY	–
Nucor Crawfordsville, Indiana	Danieli	Galvanizing line (1,575 mm wide, 0.25- 1.75 mm thick for coating down to 36 g per sq meter at 170 mpm) and 0.25 Mstpy colour coating line for same dimensions	H2 2024
Nucor, W. Virginia	SMS group	Complete meltshop for new facility: 2 x 190 t DC EAFs, 2 x twin ladle furnaces, 2 x vacuum tank car degassers	H2 2024
Nucor, W. Virginia	Danieli	QSP-DUE® direct rolling technology for new mill to produce hot strip (3 Mstpy HR strip up to 2,100 mm wide and 0.8-25.4 mm thick) plus two cold-strip rolling projects: New pickling line and tandem cold mill (and 0.45 Mstpy stand-alone temper mill) to process 2.3 Mstpy of HR strip, 0.80-6.35 mm thick, up to 1,982 mm wide, into 0.25 to 3.05 mm thick CR strip for both construction and automotive products	H2 2024
Vietnam			
Hoa Phat Dung Quat Steel	Danieli	Two BFs for Steel Complex II, adding 5.6 Mtpy of liquid steel to capacity	–
Hoa Phat Dung Quat Steel	Primetals Technologies	Two slab casters and a hot rolling mill to increase production by 5.6-million tonnes	2024

Global copper market drivers push and pull

Multiple drivers are pushing and pulling copper supply and demand. Myra Pinkham reviews their impact and gathers expert opinion on what may happen next in the markets for the red metal

Although they have increased, copper prices have risen less in recent months than many other commodities. The copper market has generally been less impacted by the war in Ukraine than other metals, such as aluminium, nickel and palladium.

"There are several reasons for this," Edward Meir, head of research for ED&F Man Capital Markets, said, including that copper is not really in very short supply and its production is not concentrated in problem areas. Also, another market observer pointed out that copper is less energy-intensive to produce than is the case for certain other metals, so it has not been as impacted by the surge in energy prices that has been one of the main international consequences of the war.

Despite this, Andrew Cole, Fastmarkets principal metals and mining analyst, said that he expects the global refined copper market will be in a supply deficit this year, as it was in 2021, although he is forecasting that the deficit will narrow slightly this year to about 411,000 tonnes from last year's deficit, which the latest International Copper Study Group (ICSG) forecast sets at about 475,000 tonnes.

As that is still a large supply-demand imbalance, Cole said that, at least based on market fundamentals, that should support higher copper prices. "But there is more in play than just market fundamentals," he pointed out, including all the macroeconomic and geopolitical uncertainties. "That will translate into plentiful price volatility," he said.

That volatility is likely to continue not just in the near term, but probably through the medium-term, according to Geordie Wilkes, head of research at Sucden Financial, given that, even if peace talks succeed, the sanctions that have been imposed upon Russia are not going to be released immediately, "And that could even cloud the longer term outlook."

Meanwhile, he noted that with growing inflation in most regions of the world, central banks, who were initially slow to react, are now tightening their monetary policies. He said that these higher costs, particularly higher energy costs, is affecting consumer demand for goods and services, and therefore copper demand.

John Mothersole, a director of S&P Global's market intelligence unit, said this, as well as a recent revival in global copper mining capacity, is supportive of a consensus that started to build late last year that the copper market is about to transition, at least for the next few years, from deficit to surplus. He said that will still likely be the case even with the war in Ukraine disrupting some supply chains globally, and with Russian products, including copper, being rejected in many parts of the world – although not necessarily by China or India. "And even if companies are willing to accept Russian material, they might find it difficult to find a financial institution to underwrite the transaction," he added.

With the market moving into surplus, Michael Haigh, head of commodity research for Société Générale, said that copper prices will likely move downwards from about $10,300 per tonne at the end of March to $9,000 a tonne, or even slightly lower, by the end of the year, hovering at that level until 2024, at which time it could even briefly fall below $8,000 per tonne before starting to move back up again in 2025.

A green transition

Colin Bennett, market intelligence director for the International Copper Association (ICA), said that given all the green drivers in the marketplace – including the push for electrification, growing use of such sources of renewable power as wind and solar and the increased need to improve energy efficiency, there should be continued, albeit largely incremental (a few percentage points per year) growth in demand for such copper products. "While in these uncertain times people have generally been holding back from making any big forecasts or claims, it is clear that the energy transition, while being a long-term game, is under way.

It will have positive implications for copper. In fact, Vivek Tulpule, head of economics and markets for Rio Tinto, said that over a quarter of copper consumption in 2050 will be attributable to the additional demand associated to the transition to net zero emissions.

Christian Georges, Société Générale's head of metal and mining research, said that electric vehicles (EVs) generally have four times the amount of copper as internal combustion engine (ICE) vehicles. "Also, as demand for EVs increase, so will the demand for electricity and for the production of microchips," he said, all of which could lead governments to push for more copper production in certain areas.

Another reason why the copper market is not seeing as much volatility as some other metals is because copper demand in China, which accounts for about 50% globally, seems to be slowing, Meir said, pointing out that a change from 10% to 2% economic growth per year is a huge swing, and one that results in about a million ▶

RIO TINTO

Underground operations at the Oyu Tolgoi copper/gold project in Mongolia, which is expected to produce about 500,000 tonnes of copper per year starting in 2028

tonnes of copper being held back, especially given that China's real estate market, which accounts for about 9% of global copper consumption, is struggling very badly.

Meir noted that this comes as Chinese real estate developers have become overleveraged in wealth management products and that now, with property prices falling for five of the past six months, people are not as infatuated with real estate in China as they once were. He said that this real estate shock is expected to reverberate down the value chain, with copper being one of the commodities that will be impacted.

Meanwhile, recent lockdowns, which are part of China's zero-tolerance Covid pandemic policy, could have a negative impact upon the copper market as they could affect the production of copper-containing goods. Georges noted, however, that at the same time the Chinese government has been providing certain incentives aimed at boosting the nation's purchasing managers' index (PMI) growth rate and energy infrastructure. "Their build-up of such alternative energy generation as wind and solar farms also requires the building of transmission lines to transport that energy, and most of those cables tend to be made from copper," Georges said.

Overall, Cole said that Fastmarkets is forecasting that Chinese apparent copper demand will be up by about 5.2% in 2022, following a flat year in 2021 when the stocks that were built up in 2020 were worked down. But Wilkes noted that the Chinese manufacturing PMI is currently only 50.2%, which is barely expansionary, and its GDP growth is expected to soften from its fourth-quarter rate of 4%.

Mixed international picture

Outside China copper demand is mixed, largely based on the regional macroeconomic situation. While Fastmarkets is forecasting US copper demand to grow by about 7% in 2022, Cole said that in Europe – being hit hardest by the consequences of the war in Ukraine – copper demand could contract by 2-3% with high energy costs being a major negative factor for Europe, given its dependency on Russian oil and gas.

Mothersole said that the war in Ukraine dominates everything in Europe, noting that last year European copper consumption was up by 7-8% in 2021, but now with Russia's invasion of Ukraine, he is expecting European GDP growth to only be about 2.4% in contrast with expectations for 3.1% GDP growth prior to the war.

Much of that impact, according to Wilkes, is the effect that inflation has had upon European consumer confidence and therefore purchases of certain products. He said that that even with the push for more EVs, European auto registrations are down, given the combination of higher vehicle prices and the continued shortage of semiconductor microchips. He said that European construction activity has also been easing and that all these factors will likely filter down to lower demand for copper wire and cable, not just in Europe

but across the globe.

Carlos Risopatron, ICSG's director of economics and environment, pointed out that even before the war energy costs were already negatively impacting the European market. While some of these trends are also affecting the US, its copper demand growth has, at least to date, been more resilient. But while currently US manufacturing activity is strong, with more growth than in Europe or in China, the Institute for Supply Management's manufacturing PMI, while staying well into positive territory at 57.1%, eased slightly month on month in March, and while US housing starts moved up in February new permits slipped.

Globally this year there seems to be less interest in substituting aluminium for copper, with ICSG's Risopatron attributing that not only to the increase in aluminium prices due to the war in Ukraine, but rising energy prices over the past six months. This, according to ICA's Bennett, is a reversal from last year when the global substitution rate increased to 1.32% from 0.95% in 2020. "Copper prices are still higher than aluminium prices," Mothersole pointed out, "But the current differential isn't wide enough to stimulate substitution."

Supply growth

Meanwhile, the outlook for the supply side of the equation is cloudy. "There are quite a lot of mine projects that could potentially be expanded," Bennett observed. "But because of certain regulatory issues there has been some hesitation in the mining industry, which has been preventing some of those expansions from going ahead.

One example of this is Antofagasta's Twin Metals copper and nickel mining project in Minnesota, which, reversing an earlier decision, had two mineral leases canceled by the US Department of the Interior on environmental grounds in late January.

Nevertheless, there is optimism about certain other projects, Mothersole said. For example, the Anglo American Quellaveco Mine in Peru, as well as the Taseko Florence Mine in Arizona – a new greenfield mine in the US – are expected to have their final permitting approved. Underground operations are now under way at the Oyu Tolgoi copper/gold project in Mongolia, which, according to Jakob Stausholm, Rio Tinto's chief executive officer, is expected to produce about 500,000 tonnes of copper per year starting in 2028.

"Not only has the amount of red tape to get new mine projects been increasing," Société Générale's Georges pointed out, but the grade of copper at such new mines have been decreasing. Nevertheless, he expects that new copper mine capacity will increase by about 7% over the next two to three years. "But given the expense of doing so, companies are being very cautious about launching new projects."

On the plus side, Cole pointed out that lately mine disruptions have not generally been as severe as they had been in previous years and in many cases new mine projects, such as the Kamoa-Kakula project in the DRC, have been ramping up impressively. Wilkes also pointed out that the Grasberg Mine in Indonesia and Chuquicamata Mine in Chile should be stepping up their production this year. Cole said all of this is contributing to the copper market's transition from deficit to surplus and is behind a higher benchmark TC/RC in 2022 and the rising spot TC/RCs so far this year.

The rate of mine production increases, however, has varied – not just by region, but also by country. Mothersole noted that while Peruvian mine production has been up nicely since the beginning of 2022, that has not been the case in Chile, where it has at least temporarily sputtered out early this year, despite the recovery that had been seen in the second half of 2021. He said, however, it is likely that it will improve again late this year or early in 2023, which he said will be a contributing factor to copper's expected transition into surplus.

However, one concern will be the decline in resources and in ore grades, Mothersole noted, although he is hopeful that improvements in mining technologies could more than compensate for that.

The cost of investing in new capacity is another factor, Risopatron said, observing that while prices would seem to be high enough to encourage miners to step up their production, "But their costs are also going up."

Meanwhile, Cole pointed out that another factor is Russian copper supply, although he said it is likely that supply will be redistributed from the West to China, rather than being totally lost, therefore not really affecting the global supply-demand balance.

Meir noted that the reluctance for companies in the West to buy Russian copper is exacerbated by the issues they would face with financing, shipping, warehousing and insuring Russian metal. He said the question is whether all the 800,000 tonnes per year of Russian copper – which is about 4% of the global copper supply – will be able to be redistributed, or only about half of that, which, if that were the case, could result in about a 600,000 tonne overall deficit. He added that while that would be a substantial deficit, it is not enough to drive copper prices much higher, as there would be enough supply from both the refined and scrap side to cool off such a rally.

At the same time, much as for most base metals, copper inventories are low at present. Surprisingly that has not lifted copper prices as much as might be expected, Haigh said – perhaps because the market is expecting the short-term supply situation to come to the rescue.

"It has been a challenging market so far this year and it will likely remain challenging, if for no other reason than because of all the moving parts and economic and political uncertainties," Mothersole said.

Global refined copper supply-demand balance ('000 tonnes)

	2021	2022f
	Year	Year
China	10,637	11,136
Americas	4,419	4,607
Europe	3,743	4,015
Others	6,240	6,570
Production	**25,039**	**26,328**
% change y-on-y	2.2%	5.1%
China	14,457	15,202
USA	1,817	1,944
EU	2,900	2,817
Others	6,461	6,775
Consumption	**25,635**	**26,739**
% change y-on-y	2.6%	4.3%
Balance	**-596**	**-411**
% of consumption	2.3%	1.5%
Reported stocks	**1,308**	**897**
Weeks' use (reported)	2.7	1.7

Source: ICSG, Fastmarkets

Argentina encourages lithium projects to meet high demand

A bullish long-term outlook for lithium has resource-rich Argentina looking to incentivize bringing more projects into the country over the next three years to meet soaring global demand for the battery raw material, report Cristina Belda, Davide Ghilotti and Justin Yang

Speaking to Fastmarkets in London in February, Argentinian government officials explained how the government is doubling down on lithium as a pillar of the country's growing mining sector. Supported by business-friendly initiatives to attract capital and a developing common framework for prospective developers, Argentina aims to strengthen its lithium output and processing capacity in the coming years.

"President Alberto Fernández and provincial governments are clear about its commitment to speed development of the country's lithium resources; Argentina aims to be a mining country," mining secretary Maria Fernanda Avila told Fastmarkets in London.

Argentina is situated in the so-called "lithium triangle," alongside Bolivia and Chile, where more than 70% of the world's lithium reserves lie beneath its salt flats. The northern Argentine provinces of Salta, Catamarca and Jujuy are where lithium operations from incumbent and new developers are concentrated.

Argentina's pivot toward lithium miners follows a bullish outlook for the material, with electrification and decarbonization expected to generate long-term demand. Fundamentals are expected to remain firmly bullish in the coming years. Fastmarkets analysts are forecasting a global supply deficit of 89,000 tonnes lithium carbonate equivalent (LCE) in 2023.

Fastmarkets assessed the price of lithium hydroxide, monohydrate $LiOH.H_2O$ 56.5% LiOH min, battery grade, spot, cif China, Japan & Korea at $52.50-55 per kg on February 16, up almost 500% compared with a year earlier.

Important economic pillar

"Mining will be an important pillar of the Argentine economic future," Flavia Royón, secretary of mining for the Argentine province of Salta, told Fastmarkets. "Argentina hasn't [always] had a strong mining tradition, but because of laws that were set up already in the 1990s, an advantageous framework was developed and we're seeing that today."

"Eighty percent of [the country's mining potential] is undeveloped and unexplored," she added.

While mining currently accounts for 0.6% of Argentinian gross domestic product, it has potential to grow to around 3%, as per government estimates. The country currently accounts for around 16% of global lithium output, Fastmarkets battery material research team estimates.

Two active producers with operations in the country, Livent and Allchem, are soon to be joined by an array of developing projects that are expected to come online over the next two to three years.

Canada-based developer Lithium Americas is planning to start operations at its Cauchari Olaroz brine site in Jujuy later this year, where it targets a commercial output of 20,000 tonnes per year of lithium carbonate. In January, the company concluded the acquisition of Millennial Lithium, which owns the Pastos Grandes brine project in nearby Salta.

Last December, Rio Tinto agreed to acquire the underdeveloped Rincon brine lithium project in Salta.

Investment is flowing in not only for the exploitation of mining tenements, but also aimed at downstream processing capacity. Chinese mining firm Zijin earmarked $380 million to set up a lithium carbonate plant in Catamarca by 2023, targeting a 20,000 tpy capacity. South Korea's Posco has also announced plans to invest $4-billion on a lithium processing plant in Salta with an annual production capacity of 25,000 tonnes of lithium hydroxide, due for completion in 2024. Executives from Posco met with Argentina President Alberto Fernández on March 21 with the company beginning construction operations to set up a lithium hydroxide plant in the north of the South American country.

Eramet and Tsingshan are also working to restart a mothballed lithium plant in Salta.

The number of deals under way and the growing global appetite for the mineral have fuelled optimism. "In my opinion, in five to seven years, northern Argentina could account for up to 300,000 tonnes of lithium output," Royón said.

'Mining will be an important pillar of the Argentine economic future'

Rights ownership structure

One of the key differences with its neighbors is that Argentina's federalist structure gives provinces original ownership of mineral rights, which they can exploit according to their own constitutions. The provinces in Argentina are "the owners of the mineral resources, rather than the central government," Secretary Avila stressed.

This legislative framework is

singled out by the officials as a buffer against resource nationalism, whereby authorities enact policies to restrict private companies' access to mining resources.

Other lithium-rich Latin American countries, such as Bolivia, have so far operated under a strictly restricted framework. In Mexico, President López Obrador announced his intention to nationalize lithium and create a state body to control the exploitation of reserves.

"Here each province sets the legal framework. We are not going to change our legislation," said Avila on the topic, highlighting that the provinces in Argentina have ultimate say in how their resources are handled.

Argentina's federal structure is also more attractive to investors, the officials claimed, compared with countries where lithium exploitation is fully controlled by the state, which can lead to bottlenecks in permitting and a longer process for new projects to take off.

In neighboring Chile, all new lithium projects require approval through the Chilean Economic Development Agency state body. "The Chilean model has its limits," said Alfredo Fierro, director of trade and investment at the British Embassy in Buenos Aires.

The Fastmarkets research team is currently following six junior projects of interest in Argentina, while only one in Chile. The latter did recently offer five new quotas for exploration, so there might be developments there in the future, although Argentina has to date shown a more active setup for developers.

In a bid to streamline existing and prospective developers, the nation's three lithium-rich provincial governments of Jujuy, Catamarca and Salta set up the so-called Mesa Nacional del Litio late last year – a table of cooperation to agree a common way forward. "The goal is for the three provinces to jointly set out regulations for mineral exploitation and industrialization [of lithium deposits] within a sustainable, environmental and federal perspective," Secretary Avila told Fastmarkets.

ESG opportunities and risks

In addition to financial incentives, Argentina is hoping that it can help producers meet environmental, social and governance (ESG) credentials by producing lithium in the country.

From left to right: Flavia Royón, secretary of mining for Salta; Maria Fernanda Avila, Argentine secretary of mining; Mark Menzies, UK special envoy to Argentina; Javier Figueroa, Argentine ambassador to the UK.

As original equipment manufacturers (OEMs) increase scrutiny of their supply chains following stricter ESG parameters, localization of supply is set to continue to be an important topic for corporations. Large automotive producing countries such as the United States are also looking to tap into their own reserve to ensure closer-to-home, traceable raw material supply.

On a carbon emission basis, the country hopes that its portfolio of renewable energy can attract producers looking to showcase lower carbon footprints.

Prospective producers might be able to tap into what Royón called the "best zone for solar energy" and highlighted the La Puna and Altiplano solar park on the border of Salta and Jujuy, which has a capacity of more than 200 MW.

Lithium producers may also invest in renewable energy plants to power their facilities. The government used the example of China's Ganfeng, which is going to invest in a 120 MW photovoltaic system to generate electricity for a lithium extraction plant in Salta's Salar de Llullaillaco.

There are other projects like this, and the mutual interest from both renewable energy companies and miners to develop further projects in the off-grid mining sector can play in Argentina's favor as the country's wind and solar infrastructure accelerates.

Argentina's mining representatives said there is room for producers to highlight the social aspect of ESG through cooperation with the provincial governments. Prospective producers will sit at a "social table", which consists of the producers and local community stakeholders, to discuss impacts of developments.

The projects will be intrinsic to bring benefits from jobs in the community (a certain share of the workforce or suppliers must be sourced locally, according to provincial laws) to investments in public services. "All society takes the risk, and all society reaps the benefits," Royón said.

But there are also inherent environmental risks to the exploitation of local resources. As for neighboring Chile, concerns revolve around the use of water and potential availability shortages. According to the World Bank, Argentina has "water security gaps" in certain areas. With roughly 500,000 gallons of water needed in the production of one tonne of lithium, the scale of the new projects has created opposition among communities.

There have been some protests in Catamarca and Jujuy, which led to exploration halts in some cases. Environmentalists and local communities demand that, before projects progress, priority is given to determine what impact it would have on water availability in the area.

The provincial secretary said that water resources are there, and new basins are in development, adding that the government is producing an industry-focused hydric stress study for Argentina. "This will tell us what the hydric stress of mining across the country is," said Royón. "We have to ensure there is constant monitoring of the resources to understand what the availability and the consumption is," Royón added.

Macroeconomic uncertainty

Argentina's macroeconomic situation has been a source of concern to foreign lenders and investors. The Argentine economy has faced numerous economic challenges in recent years, including an unsustainable build-up of debt, rapid depreciation of its currency, steep economic contraction and a level of inflation that hit 50% in 2021.

On January 28, Argentina struck an agreement with the International Monetary Fund over a new set of measures and deadlines to restructure its $44.5 billion debt. But this time, unlike in the past, austerity is not a condition imposed by lenders. The deal would allow for spending increases on infrastructure and science and technology, where mining plays a key role.

"It's far from ideal, but it was the best agreement possible," said Nicolas Carlos Abad, second secretary at the UK embassy of Argentina. "It shows our commitment to repay the debt. [With this deal] we have shown that Argentina is not going to default."

Opportunity knocks for traders

The lithium market environment is increasingly attractive for commodity traders, report Davide Ghilotti and Dalila Ouerghi

While until recently the lithium space was mostly characterized by a notable absence of intermediaries – aside from a few – and relied mainly on direct seller-buyer interactions, the surge in prices of lithium compounds, as well as the expected growth in demand across the lithium complex in the coming years, are creating new opportunities for intermediaries.

This has been particularly evident in the domestic Chinese market where spot liquidity has historically been more relevant than in other regions with an established spot market and participants in it.

Market prices surged last year following the multi-year lows of 2020 – the commodity entered a new bullish cycle supported by high demand for EV batteries. This supported a price uptrend across the lithium complex, including technical grades, battery grades and spodumene concentrate feedstock. Early this year, Fastmarkets' price assessment for lithium carbonate 99.5% Li_2CO_3 min, battery grade, spot prices cif China, Japan & Korea was $44-47 per kg on January 27, rising by 574% from $6.00-7.50 per kg in January 2021.

The assessment for lithium hydroxide monohydrate $LiOH.H_2O$ 56.5% LiOH min, battery grade, spot price cif China, Japan & Korea was $41-43 per kg on January 27, an increase of 366% at the mid-point from $8.50-9.50 per kg a year earlier. The rally was triggered by a rapid change in direction in Chinese domestic lithium prices.

The fast-paced growth of the market, together with underlying demand trends, led to carbonate overtaking hydroxide and trading at a premium. The growth story also highlights a market where traders can identify new business opportunities.

This has been particularly noticeable in the carbonate market due to its larger share of the total lithium market (carbonate accounted for about 65% of total lithium production in 2021) compared with a smaller, but growing, hydroxide market (32% of total production in 2021, with other lithium salts making up about 3%).

In previous years, the few intermediaries active in lithium used to limit themselves to handling spodumene. But with the entire complex poised for strong growth, commodity traders are increasingly interested in the downstream lithium chemicals market.

Carbonate has fewer logistics complexities than hydroxide, sources in China acknowledge; this allows for it to be easily interchangeable among players across the supply chain. Additionally, the booming carbonate market in China also led to material with low-grade specifications entering the battery supply chain for certain entry-level applications.

In the market environment outlined, this means lithium carbonate as a product lends itself better to the intermediary activity of traders than hydroxide. This, however, is set to evolve while battery demand expands outside of China, where different battery chemistries and OEM strategies are likely to prompt growth of the overall size of the hydroxide market.

Commoditization

The increased presence of traders in lithium is one element in the "commoditization" narrative that was a topic debated a few years ago – market participants and observers were split between those who considered lithium as a pure specialty chemical or a commodity. While the industry has since moved on, that debate remains relevant to understand the sector today and its continuing evolution.

The lithium market's strong demand growth prompted a tightening of product specifications and brought about increasingly stricter quality parameters in response to requirements by large consumers, such as OEMs. Supply of new compounds was established with those higher quality parameters, de facto enforcing a new standard.

In carbonate, that led to units being more homogenized in terms of product quality, making them more interchangeable across the market, with consumers less tied to one producer's specifications.

While the sector may continue to be considered a specialty chemicals business overall (including the specialty, non-battery grade applications), some components of the market have increasingly behaved like other commodities. Lithium carbonate has moved in this direction, attracting commodity specialists such as traders.

"When a market is growing rapidly, when consumers are scrambling for material and prices are all over the place, then opportunities for traders emerge," William Adams, head of battery materials research at Fastmarkets, said. Some participants suggest the involvement of traders has partially contributed to this year's price rally in lithium in the domestic Chinese market, which eventually filtered through other regions.

"Through the past year this has been happening: there were traders withholding stocks and then releasing it to the market," one converter source said, adding that the current tightness means that strategy is now less evident: "Most of the traders that I work with have limited stocks on hand now."

"Commercial arms of big producers" rather than full-blown traders have become more active in the past year, especially in China, a Europe-based trader suggested. "I don't think traders have been squeezing the market in China but [rather] big producers have been holding inventories [to support price growth]," he said.

Traders' engagement in lithium is showing instances of direct involvement with new projects, proving expertise and trade finance.

In December, Traxys and start-up European Lithium said they will cooperate to develop the Wolfsberg Lithium Project in Austria, where the junior is seeking to set up a lithium hydroxide operation by the end of 2023. Around the same time, Traxys also signed a multi-year offtake agreement with Canada-headquartered junior miner Lepidico. The trader will provide sales, marketing, logistics and trade finance services for 100% of the initial phase of the company's lithium hydroxide production, which is expected to come online in 2023.

The development of financial instruments such as derivative futures contracts, which have been launched by several commodity exchanges to provide tools to participants in the battery raw materials supply chain to manage price risk, will also benefit traders.

The Singapore Exchange (SGX) is looking to launch four futures contracts – for cobalt metal, cobalt hydroxide, lithium carbonate and lithium hydroxide – in the first half of the year to provide new hedging instruments for participants involved in energy transition, it said earlier this year. "The combination of fast-moving prices, concern about supply and the emergence of traders is likely to increase the need for risk management tools such as exchange-traded futures," Adams said.

Graphite prices rise

The synthetic graphite market has been supported by increasing feedstock costs plus rising demand from the anode sector, resulting in higher prices for spherical natural graphite, report Jon Stibbs and Sybil Pan

Graphite electrodes, made from synthetic graphite, have been rising strongly in price since Fastmarkets began to assess the market in mid-January. Fastmarkets' graphite electrodes, ultra-high power, fob China, price assessment was $4,250-4,560 per tonne on Thursday March 30, a rise of $620-790 (19.05%) since the market was first assessed at $3,460-3,940 per tonne on January 19, 2022. Similarly, Fastmarkets' graphite electrodes, high power, fob China, price assessment was $3,600-3,780 per tonne on March 30, an increase of $610-630 (20.20%) from $2,990-3,150 per tonne on January 19.

Graphite electrodes are used in steel production and have been subject to a sharp rise in feedstock costs. The prices of needle coke and petroleum coke have been continuously rising since the start of the year. In China, the largest producer of synthetic graphite, coke prices have risen by 23.53% and 11.57% month-on-month, respectively, to around 8,000-13,000 yuan ($1,260-2,050) per tonne and 6,000-7,500 yuan per tonne, according to sources.

In addition to rising feedstock prices, the European Commission has imposed anti-dumping duties on Chinese graphite electrodes, which has added to upward pressure on prices for consumers in Europe.

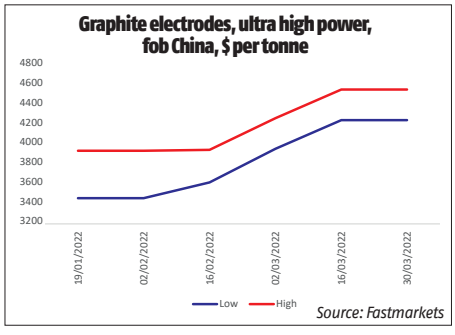
Meanwhile, synthetic graphite for the lithium-ion battery anode sector has faced the same feedstock cost rises as for graphite electrodes. Additionally, graphite electrodes and synthetic graphite for anodes can rely on the same graphitization processing.

As the anode market has developed in China, it has increased competition for these graphitization facilities with the result that their availability has tightened significantly, raising costs and hindering production of both materials. There is an expectation that this tightness will continue this year even if the worst has eased in China.

"Graphitization capacity might get less tight in comparison to the second half of last year when China's power crunch was at its height," a battery producer told Fastmarkets. "But we have to admit that there is still prevailing tightness in availability across the anode supply chain, be it for the synthetic raw material or graphitization."

At the same time that feedstock prices have increased and graphitization has become more challenging, production in China has been hindered by restrictions to prevent the spread of the latest wave of coronavirus.

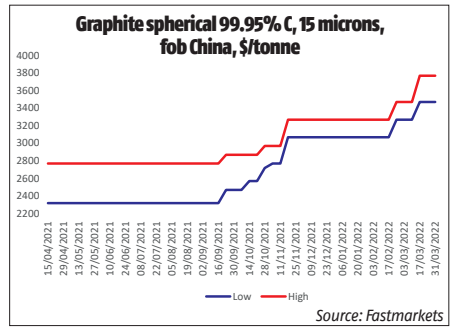
"Aside from the hike in prices of raw materials, there is concern about availability among downstream consumers amid China's Covid-19 outbreak, causing transport interruption for some producers in the north part of China," a second anode producer source said. Surging costs and tightening supply of raw materials and processing facilities have resulted in tighter availability of synthetic anode material for the rapidly growing electric vehicle sector, say sources.



Shifting to natural graphite

The combination of raw material and graphitization costs account for approximately 85% of production cost of graphite anode material, according to sources. Therefore, the steep price hikes of synthetic graphite are an incentive for battery manufacturers to increase the share of natural graphite in their anodes, which is estimated to be around 80% in China.

Anode consumers prefer synthetic material due to its higher purity and the consistency of its specifications. Additionally, synthetic graphite offers a longer lifespan and faster charging. However, natural graphite is about half the cost of synthetic, according to Fastmarkets' research team. As a result, industry participants expect natural graphite to take a higher share of the anode market with its lower cost profile and a higher capacity.



Emerging production in South Korea, Japan and Europe is already favoring a higher share of natural graphite than in China, say sources.

Spherical graphite production is dominated by China, but other producers are starting to come on stream. Integrated natural graphite company Talga commissioned the first lithium-ion battery anode plant in Europe at the end of March.

Synthetic graphite production is highly energy intensive, whereas natural material has a significantly smaller carbon footprint, which is another attraction for electric vehicles manufacturers marketing a sustainable product. Spherical natural graphite prices have also been rising in response to increased demand and limitations on supply. Fastmarkets' graphite spherical 99.95% C, 15 microns, fob China, price assessment was $3,500-3,800 per tonne on March 31, a rise of $1,050-1,200 (44.55%) from $2,300-2,750 per tonne on April 1, 2021.

The production of natural graphite anode material in China has also been hit by supply-chain issues, such as strict anti-pollution controls in Luobei county and global logistics interruptions over the past two years, according to sources. Natural graphite maintains a strong cost advantage over its synthetic equivalent although feedstock costs for spherical graphite have also risen. Fine graphite flake prices have surged in price following tightening supply from China and Africa, and a rise in demand. Fastmarkets' graphite flake 94% C, -100 mesh, fob China, price assessment was $830 per tonne on March 31, an increase of $285 (52.29%) from $545 per tonne on April 1, 2021.

Artificial intelligence extends its range

The breadth and depth of applications of artificial intelligence throughout production and business processes continue to increase. Stefan Koch, SAP global lead for metals, told Richard Barrett that the combination of artificial intelligence and machine learning across enterprises is delivering ever more benefits now

Everyone is using artificial intelligence (AI) to their advantage now, said Stefan Koch, SAP global lead for metals. "A quick win can become even quicker because everyone is using it and it has become more of a commodity because of more knowledge in the market everywhere," he noted.

Some areas of business have more knowledge of AI and machine learning (ML) than others. For example, production processes have been a focus for their implementation, forming an area where there is extensive experience of how to deploy them.

Koch questions whether all the big wins from a financial perspective – all the low-hanging fruit – have been achieved. "Let us say that if there is a knowledge gap then ML or AI can offer a better path to make better decisions, so if you didn't understand the process or something, then you can gain a really big win. But I'm not sure that has not been harvested already because the technology is already there," he added.

While Koch still sees plenty of further applications for ML, he pointed out that the technology is already mature. "You have different cycles for technology," he reminded, noting for example that at present everyone is talking about the metaverse as the new innovative frontier, but also that it is unclear how that will evolve. But as more knowledge is gained about any technology it gradually becomes an accepted commodity rather than being cutting edge.

"I think machine learning has been important for several years now and it is increasing, and may be on the peak, or it may be beyond the peak because you just use it in certain areas," Koch explained. In other words, ML has simply become a normal part of the business for SAP and many of its clients.

SAP

Stefan Koch, SAP global lead for metals, said that combining machine learning with other business beyond production processes is a focus of attention now

Building on that foundation, the interest is in where things are moving to now. The combination of ML with other business beyond production processes is today's focus of attention.

"One of our companies is looking into production planning, where you have certain rules and you give some guidance," Koch illustrated. "Then they try to complement that, in the casting area for example, with ML to identify the best technology to use in the casting process." It is the interaction between the fixed rules and planning with ML on top of that which provides an extra advantage.

Koch also said that there is much progress in logistics and supply chains. "You can have nice algorithms for planning, but there are other different ones for ML. It is the combination that companies are looking into right now. You have a roadmap where ML changes the application a little bit," he said.

That can be seen at big steel companies, he added. "ML is making in-roads into different areas now and offering, let's say, a combination of other processes and other technologies."

Precious metals provide another example. "You have flotation processes etc. that go into the area of production by using big data and optimizing the process. From SAP's perspective you can see this deployed in the expert system of the asset, but also standalone," he explained.

"You pull it out and see that you can achieve something," Koch said, observing that there are certain specific areas within the multi-million-dollar capital equipment needed for production processes, such as ore beneficiation and refining, or for steel plants, where improvements can still be made.

Sometimes operators of capital-intensive plants turn to the OEM plantmakers for support with ML. Others choose to build on their own operational experience with niche partners for specific projects. Koch

observed that cost and operators' existing levels of experience are two key factors influencing their choice.

SAP provides support for the second model and is working with trusted partners itself. "We have a strong ecosystem with partners and also with products, and we see a number of start-ups that are coming up, using ML for their small and mobile niche. But they need a platform to grow and get into the operations of a new business," Koch noted.

Whatever means companies choose to combine ML with AI, questions must be answered as to how to make a business case, how to keep control of your data, and how an organization will be able to make best use of it itself.

"That is a change from a year ago because back then it was still all about technology – how to get it done and discussions about solutions – and now it is tipping over into a maturity curve, where it is not so much about application, but more framework, more interest in processes and how you connect that, said Koch"

Framework and flexibility

Businesses using SAP's solutions are at different stages of making a transition from conventional ERP systems, traditionally run on premise in the past, to systems that are partially or, at their most advanced, wholly cloud based.

SAP S/4HANA is the core platform (intelligent suite) provided by SAP, on which multiple additional SAP business process and other modules run, many with embedded analytics provided by SAP. Many other independent partners with SAP provide business apps for specific sectors, including mining and metals, for use in the industry cloud.

While major and long-established international steel and metal businesses have and need the stable plants and processes brought by their size and standing – together with substantial legacy IT and software systems that many are in the process of moving to cloud-based computing through multi-year programmes of transition – smaller start-up businesses typically offer innovative new solutions and use the latest cloud-based systems.

The question arises then of how businesses at opposite ends of the size scale can be brought together to mutual advantage. Koch noted that start-ups have the advantage of being quite flexible, but sometimes have the disadvantage of not necessarily having a reliable framework. SAP aims to combine the best of both worlds. "We have our classical ERP (enterprise resource planning) background, so we try to have a standard in place so that you have a framework that can be relied on," said Koch.

SAP has also launched a new program called Industry Cloud. Koch said that has picked up where SAP wants to go into more verticals for industry. "We cannot field everything, because then we would have multiple solutions to develop – we want to stay on a certain level. Where the wheel has already been invented we want to put the wheel on the wagon in a structured manner," he explained.

"This is why we have the BTP, the business technology platform. We work with partners at start-ups and offer them, within the Industry Cloud programme, standardized internet connectivity to SAP and then it becomes a 'Lego brick' extension to the SAP system," he elaborated.

One such SAP partner in the Industry Cloud is called Cogniac, which provides image recognition and uses visual data that integrates into the SAP world. In a forestry application, for example, the number of logs on a load can automatically be counted, along with their quality and size through image recognition.

A similar thing can be done with steel tubes, and automatic scrap recognition for quality has been available for a couple of years, noted Koch. "It is just a question of what information value you can get from photos and image recognition – these are the kinds of scenarios that we see," he said.

More broadly, it is a question of what level of involvement is needed for any particular application of AI to extract the value. "Is it just the brain we need to get that value? We think it is part of the business process for a certain purpose," he added.

Koch said that ML can be applied to all processes of SAP, including business processes, such as invoicing or procurement documentation. "It can just be snapped on where it makes sense, and that is why we don't necessarily recognize that because it is part of our offering and you [clients] can just do it."

Building bricks

Koch compares algorithms that consistently perform the same functions to children's interconnecting plastic building bricks.

"The brick itself is successful, but the ingredients of the brick might change, because technology advances with ML and it can go down to a detailed technical level because there is an open community so everybody will have that," he said.

It is time- and cost-efficient to start with an assembly of, say, ten pre-assembled bricks rather than start with single ones, which enables results to be achieved faster. "We do that in SAP and we have the partners of SAP doing that, so we try to have the ten blocks stuck together that you can progress more quickly," he explained.

"You can still work with bricks, but you don't make the final model. With bricks, everybody has them – that is not the differentiator. The differentiator is the creativity to make use of them and how efficient you are – if you are in a competition to build a model, that counts – that is where we see that now."

Koch said that the power of standardized processes is not always appreciated or recognized. While they may be taken for granted, reinventing them could take "more than a lifetime to put together [from scratch] with pen and paper."

Improvements to a business process can sometimes be made, but in a way that the SAP customer base just sees that the system keeps running as normal. "The beefing up of something that is just running is to some degree boring, but there is real power behind it in that it is running and every time you are improving and making it more beautiful," said Koch.

Value for big firms

Koch has not seen any recent big changes for large companies, but he noted that the adoption of technologies for sustainability and green metals is a trend. "Also keeping the lights on for raw material supply and the supply chain, the optimization of costs and negotiating prices," he added.

For sustainability, he envisages a lot of efficiency gains in certain areas to improve processes and make use of recycled material, noting that the levels of recycled materials used can be limited according to process, but that a certain percentage needs to be reached to provide an optimal process and product.

Regulatory changes are also pertinent. "There might be certain impacts coming in like the use of a certain percentage ▶

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SAP

Production planning can be complemented with machine learning to identify the best technology to use in the casting process

of recycled material, implying higher or lower taxes, so a lot of new changes coming that will give some space for ML and AI," he observed.

From the operational and production level, engineers have already deployed ML and AI, and students coming from university "just do it," having already obtained knowledge of open-source software technologies like Python.

ML and AI for machine optimization in the production of steel and metals are well established, but Koch identified other areas where they are finding application. "We can see it in other areas, like apps for legal changes where you have things like automatic trawling through all the legal changes that are coming in each country. You can find whether there is something that is important for you or if there is some content you have to go through to obey the law," he noted, citing changes in environmental regulations as a good example.

When handling personal or news data for ML, ethical questions about information – where it has come from, its reliability, and who is pushing discussions on social media etc – are key. Within the SAP framework, there is guidance for developers for ML and AI. "There are rules to follow for algorithms, because if you go into data from sales or HR you might encounter [unintentional AI-generated] discrimination against certain parts. We have guidelines in place for our developers in that space – that has become very important," Koch explained.

"If you think about sustainable business, companies are being driven by more than just the increasing regulations. All big companies now are creating their own sustainability best practices across many areas of the business – from design and procurement to manufacturing and customer service." said Koch. "And you might wonder how smaller companies will be able to also manage all these details. This is another area where SAP can help as we are present in many countries and have a deep understanding of best practices for processes as well as complying with regulations. This expertise is what we build into our solutions, he added.

Even big companies and multinationals cannot deal with every country on their own. "You need to get a certain scale into things – and that is not something you will not see on platforms very often," said Koch. "We are very efficient at deploying that …. and that is the real power to 'get the rubber on the road' and to check that you don't have any issue and are on safe ground," he added.

He reiterated the focus of AI and ML on business processes as much as production processes now. "I think the growing part will be in the business context to deploy ML outside the metal technology perspective now, such as in HR, which might be a universe on its own, where you have application forms that you sort; or in finance, where companies are looking to better predict financial results. We are also setting that up internally at SAP within the financial world where you have certain processes to follow," he summarized.

Standardizing interconnectivity

SAP's business technology platform is embedded in its system. It is evolving and sees regular upgrades. "What we do is to make upgrades to make it more consumable. You have less programming effort, that is encapsulated," Koch explained. "You have certain interfaces that make it easier to connect into certain processes – that is not necessarily innovation that you do something completely differently – you just have to do it."

He added that SAP wants to standardize interconnectivity because there will never be just one vendor for everything and the company wants to ensure that everything can be successfully connected, which is a major investment at present.

Evolution continues

"I think that there is an evolution at the moment in SAP – we are getting more interfaces for example, bringing different things together – and we are looking for business processes and bringing them into the cloud," said Koch.

"The cloud means that we standardize processes and make them replicable and we deploy them in a an easier fashion, and I think that will fuel also the use of ML to a certain degree, because at certain points we can say there is a process that we already have in and just use that: you don't have to worry about connecting ML etc. It becomes more standard with more bricks pre-assembled, and that is making inroads for AI, and I think there will be a maturity curve."

As goes SAP, so go its partners. "More and more SAP partners with no stake in machinery – not coming from the technology angle but coming from a business process implementation angle – are picking up ML now and that will become part of their offering, with companies having more opportunities to deploy that because there are already pre-set processes etc. Innovation never stops," Koch observed.

He also noted that not all start-ups succeed, so as part of the maturity curve there is a tendency for the number of software companies involved to be smaller, but also for each successful company to get larger through organic growth or acquisition and aggregation. There are also economies of scale.

Koch also believes that there will be more standards for both ML and AI in the coming year, which could become a cost burden at a certain point. "There is the business case for why you standardize. This is the old game of innovation first that comes with payback in targeted areas. The next step is to prove the innovation can also be cost efficient across multiple areas of the business and then it can move into standardization," he concluded.

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As vehicle sales recover, EVs accelerate their share

Despite automotive supply chain issues, electric vehicles are increasing their share of new sales reports Gregory DL Morris

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While privately owned electric cars get much attention for climbing mass production, electric public transport and commercial trucks are increasingly being produced too

Worldwide electric car sales reached a record 3 million in 2020, an increase of 40% from 2019, according to the International Energy Agency (IEA). "That strong growth was a stark contrast with general car market sluggishness globally, with overall car sales down 16% due to the Covid-19 crisis," the IEA added. "After a decade of rapid growth, there are now more than 10 million electric cars on the road around the world, representing close to 1% of the global car stock. For 2030, the Net Zero Emissions by 2050 Scenario, a voluntary country-by-country initiative, projects 300 million electric cars on the road and they account for more than 60% of new car sales, compared with only 4.6% in 2020."

Of that global electric vehicle fleet of 10 million in 2020, battery electric vehicles (BEVs) accounted for two-thirds, according to the IEA. The largest increase in 2020 occurred in Europe, where registrations more than doubled to 1.4 million, a sales share of 10%, making it the world's leading electric car market for the first time. China followed with 1.2 million registrations, for a 5.7% sales share. The United States remained third at 295,000, for a 2% sales share.

For all that acceleration, however, the IEA projects that "alignment with the Net Zero trajectory will require that essentially all new light-duty vehicles be zero-emissions – electric and fuel cell – in the 2030s."

Electric vehicles (EVs) vary in type. A hybrid passenger car or light truck uses a small internal-combustion engine (ICE) operating at steady, high efficiency to charge a battery that powers the traction motors at the wheels. A plug-in hybrid (PHEVs) primarily charges the battery from a charging station, supplemented under way by the internal combustion engine. A pure EV has no ICE and can only be charged from a station. Pure EVs are commonly called battery-electric vehicles (BEVs), even though all electric road-vehicles have batteries.

While much of the attention has been on passenger cars and light trucks, the IEA stressed that "other modes of road transport are also increasingly electrified. Around 25% of all two-wheelers on the world's roads are electric, but this phenomenon is limited mainly to China." That country, along with India and ASEAN countries, account for more than 95% of the global electric 2- and 3-wheeler fleet.

'Electric micromobility' is also becoming popular in many large cities in the western world, including the US and Canada. The IEA noted that "private e-bike sales in the United States more than doubled in 2020, outpacing sales of all other bicycles, which were already up a healthy 65%."

Bigger vehicles

For all the electric scooting and cycling, micromobility generally substitutes for other forms of transportation, such as walking, pedalled bicycles and public transport. For the bigger modes of transport, such as buses and heavy trucks, there is significant growth, albeit from a very small base.

In 2020, about 82,000 new electric buses were registered globally, an increase of 10% from 2019, for a global fleet of 600,000. China accounts for the highest number of electric buses on the road by far, but electric buses are increasingly being procured in Europe, India and Latin America.

Global electric truck registrations reached a smaller 7,400 units, which was an increase of 10% from 2019, according to IEA data. Most medium- and heavy-duty electric trucks on the road are also in China, though registrations increased ▶

in Europe and the United States.

"Original equipment manufacturers (OEMs) and truck makers continue to expand the diversity of demonstration and commercial models," noted the IEA, adding that "in the Net Zero Emissions Scenario, 85% of 2- and 3-wheelers, 55% of buses, and 25% of heavy trucks sold globally [would have to be] electric by 2030." That is considerably higher than the 2020 sales shares of 3% for electric buses and even fewer for heavy trucks.

Light-vehicle demand growth

As the automotive industry begins to recover from the chip shortage, "We forecast 2022 global light-vehicle demand to grow 1%-5%," a March analysis by Morningstar noted. The stock-market research firm stressed that even such a wide range could not cover a major pandemic surge. But Russia's invasion of Ukraine has also created further uncertainty, especially in metals.

"Original equipment manufacturers have announced temporary production shutdowns, as disruption of the supply of one key component can have a dramatic widespread effect," Morningstar wrote. "Also, Russia and Ukraine are major exporters of neon gas for making microchips. Russia also exports palladium for catalytic converters, and nickel for lithium-ion batteries and stainless steel exhaust systems. The industry is scrambling for alternative supplies of parts and raw materials."

Nevertheless, the global light-vehicle sales volume increase forecast of 1%-5% in 2022 is based primarily on pent-up demand. "While we expect sales of electrified vehicles to substantially increase in 2022, we do not view this as something that influences the overall level of global light-vehicle demand," Morningstar noted.

In 2021, light-vehicle sales of 14.9 million came in far below previous forecasts for that period, with the chip shortage getting far worse in the second half of 2021 than was anticipated.

More broadly, Morningstar suggested that "the operating environment will be favorable for automakers' profitability and returns, as demand continues to outstrip constrained production, resulting in tight inventory and supporting a solid pricing environment. It also noted, however, that "auto suppliers' profitability and returns will probably suffer in the first half of 2022."

Automakers repeatedly turning production on and off from a chip crunch would cause dramatic swings up suppliers' short-term cost curve as resource planning becomes extremely difficult. "A more favorable operating environment should materialize in the second half as the production cadence stabilizes, albeit still at lower than pre-pandemic levels," Morningstar noted.

Regionally, there are many reasons to be positive on US demand, Morningstar observed. "We think the market has feared a recession in autos for years; with this finally occurring in 2020," the firm noted, adding "We see more reasons to be optimistic long term on US demand than to stay on the sidelines in fear of another crash or constant starts/stops of the economy caused by Covid-19. The chip shortage, inflation, and the pandemic bring much uncertainty, but we strongly believe there is massive demand still to be met. The fleet remains old, electric vehicles bring an exciting change to consumers as well as superior driving performance versus combustion vehicles."

It estimated that 2022 light-vehicle demand for the European Union plus the United Kingdom will be up 2% to 6%, with unit registrations of 13.5 million to 14 million. In the first half of 2021, European light-vehicle demand was relatively healthy, but the chip crisis significantly constrained production and inventory in the second half.

Sales doubled in 2021

Global EV sales reached 6.75 million units in 2021, according to Roland Irle, head of research and development and data developer at electric-vehicle world sales database EV-volumes. That figure is more than double that for 2020, and includes passenger vehicles, light trucks, and light commercial vehicles. The global share of EVs – both battery and plug-in hybrids in global light vehicle sales was 8.3% compared with 4.2% in 2020. BEVs accounted for 71% of total EV sales, PHEVs for 29%. The global auto market improved by only 4.7% over the crisis year of 2020.

"As in 2020, EVs again were resilient to setbacks in auto demand and supply," noted Irle. "The remarkable growth rate of 108% year-on-year needs to be seen relative to the low base volume of 2020. Caused by regulations and Covid-19, global EV sales of 2019 and 2020 were below the long-term trajectory and in 2021 they returned back to trend. While the year-on-year growth looks extreme, the 2021 volume is still fair."

Irle also noted that variations between the regional markets are strong. In Europe, for example, the EV share increased from 10% to 17%, with a 26% peak in December, in a persistently weak total market. In Northern America, EVs had 4.4 % share, up from 2.3% in 2020, according to EV-volumes. In China, their share increased from 5.5% to 13.3 %. For the remaining 70 markets that EV-volumes tracks, the combined EV share was 1.5 %.

Leading OEMs in EVs include Tesla and the Volkswagen Group. BYD, an international maker of buses, trucks, forklift equipment, rail transport and energy storage equipment, has delivered hundreds of thousands of units and is increasing production.

"Following the headwinds in 2019 and 2020, global EV sales were back on track in 2021," Irle reported. "For this year we expect EV sales to return to more normal growth and reach around 9.5 million units – higher if remaining issues in supply and logistics are resolved. Most OEMs have noticeably enhanced their EV offers beyond Europe, China, and North America."

Batteries and infrastructure

Beyond the vehicles themselves, ubiquitous electrification of transport for people and goods will require vast capital investments, both public and private, in battery manufacture and recycling, as well as charging infrastructure. The IEA identified that as a challenge as to which should come first: "Governments should facilitate the scaling up of battery manufacturing by creating a policy framework that reduces investment risks, for example by providing clear signals on the deployment of charging infrastructure, fuel economy standards and zero-emission mandates."

On the other side of the coin, legislators and regulators are loathe to set such standards and mandates unless it is clear that industry and the body politic will support them.

In particular, the IEA stressed that battery recycling policies "can be pivotal in preparing countries for exponential growth in EV and battery waste. Clear guidance on collecting, transporting and storing end-of-lifetime lithium-ion batteries is crucial."

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