

## NEWS AND ANALYSIS

### EU mulls central purchasing of critical raw materials

The EU announced its intention to set up a central purchasing agency in charge of buying critical raw materials, outlined in the proposed Critical Raw Materials Act (CRMA) published yesterday.

The proposal, in chapter 2 article 24 of the legislation, would see the EU set up and operate a system to “aggregate the demand” of consumers of critical raw material (CRMs) in the bloc and set up a purchasing system for the entire bloc. While details will emerge in the coming months as the European Parliament and Council ratify the deal, it could resemble similar functions in other markets, such as the Chinese State Reserve Bank (SRB) and the US national defence and strategic stockpiles.

The SRB has periodically entered the Chinese domestic market to buy CRMs such as cobalt metal, used in batteries. Recently, the administration of US president Joe Biden said it would increase and update the list of CRMs used in its federal stockpiles.

Metals listed in the EU CRMA include battery metals such as cobalt, lithium, manganese and battery-grade nickel, as well as natural graphite, magnesium, titanium and rare earth elements. Depending on the level of engagement the new EU agency has with the markets, this could put significant upward pressure on prices, as has been the case in the past when the Chinese SRB enters the market.

“Raw materials are vital for manufacturing key technologies for our twin transition – like wind power generation, hydrogen storage or batteries,” EU president Ursula Von Der Leyen said.

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## MARKETS

Key prices					
Market	Unit	Date	Low	High	±
<b>Battery Materials</b>					
Cobalt min 99.8% alloy grade du Rotterdam	\$/lb	17 Mar	17.40	18.60	nc
Cobalt min 99.8% chemical grade du Rotterdam	\$/lb	17 Mar	16.25	17.25	nc
Cobalt sulphate min 20.5% ex-works China	Yn/t	17 Mar	42,000	43,500	nc
Cobalt hydroxide min 30% cif China	\$/lb	17 Mar	9.40	9.90	nc
Cobalt hydroxide payable indicator 30% min Co cif China	pct	17 Mar	54.50	58.00	nc
Lithium carbonate min 99.5% cif China	\$/kg	17 Mar	43.00	45.00	nc
Lithium hydroxide min 56.5% fob China	\$/kg	17 Mar	67.00	68.00	nc
Lithium concentrate (spodumene) 6% Li2O cif China	\$/t	14 Mar	5,100	5,250	-300
Nickel Sulphate min 22% ex-works China	Yn/t	17 Mar	38,000	39,000	nc
Nickel sulphate min 22% cif China	\$/t	17 Mar	5,000	5,100	nc
Graphite Flake 94% carbon fob China	\$/t	14 Mar	770	820	nc
Manganese sulphate min 32% Mn battery grade ex works China	Yn/t	14 Mar	6,400	6,500	nc
<b>Technology Materials</b>					
<b>Minor Metals</b>					
Bismuth Ingot min 99.99% fob US warehouse	\$/lb	14 Mar	4.05	4.45	nc
Indium min 99.99% fob China	\$/kg	17 Mar	218	228	nc
Selenium min 99.5% fob US warehouse	\$/lb	14 Mar	10.00	11.00	nc
Tantalum min 99.8% du Rotterdam	\$/kg	17 Mar	385	400	nc
Tungsten APT fob China	\$/mtu WO3	17 Mar	322	327	nc
<b>Rare Earths</b>					
Dysprosium oxide min 99.5% fob China	\$/kg	17 Mar	284	289	nc
Praseodymium-Neodymium oxide min 99% fob China	\$/t	17 Mar	80,800	81,800	-500
Dysprosium oxide min 99.5% ex-works China	Yn/kg	17 Mar	1,950	1,970	nc
Neodymium oxide 99.5-99.9% ex-works China	Yn/t	17 Mar	580,000	590,000	-10,000
Praseodymium-Neodymium oxide min 99% ex-works China	Yn/t	17 Mar	553,000	558,000	-5,000
<b>Base Metals</b>					
Aluminium P1020 US midwest premium	\$/lb	15 Mar	0.2750	0.2850	-0.0100
Copper cathode grade A premium in-warehouse Rotterdam	\$/t	14 Mar	70.00	100.00	nc
Nickel briquette min 99.8% in-warehouse Rotterdam	\$/t	16 Mar	650	700	-50
<b>Ferro-alloys</b>					
Ferro-vanadium 78-82% V dp Rotterdam	\$/kg V	17 Mar	39.60	41.00	nc
Ferro-manganese HC Mn 78% ddp Europe works	€/t	17 Mar	1,090	1,200	nc
Ferro-titanium 70% Ti fob North America warehouse	\$/lb	16 Mar	4.10	4.15	nc

NEWS AND ANALYSIS

It is a step towards further integration of European member states' resources, which could face opposition from eurosceptic voices in parliament, especially when attempting to aggregate demand. The EU already has some systems in place that aggregate demand across energy markets as an example.

Paying attention to supply chains

The CRMA is an indication that the thinking behind these materials has evolved in the EU from a lean management approach to a more strategic view.

The central purchasing body will also stress test EU supply chains every three years and release publicly available data on the CRMs.

As part of the plans, the EU will set up a monitoring body for CRMs, including monitoring trade flows, demand and supply, stockpiles and concentration of supply.

The CRMA highlights the bloc's overreliance on single sources for certain materials.

"The EU sources 97pc of its magnesium in China. Heavy rare earth elements, used in permanent magnets, are exclusively refined in China. 63pc of the world's cobalt, used in batteries, is extracted in the Democratic Republic of Congo, while 60pc is refined in China. This concentration exposes the EU to significant supply risks," the act reads.

Industry figures have heralded the plans as a step in the right direction, pointing out the EU has not engaged with this level of supply chain management, unlike other geopolitical rivals.

"Today's announcement marks a positive step forward for European Critical Raw Materials supply security and independence, amid its rapid transition to electrification and net zero," Vulcan Energy Resources chief executive Francis Wedin told Argus. "Very recent history in Europe has shown that it is naive to rely on external supplies of energy and critical raw materials."

The move comes at a time of increasing nationalism, protectionism and attention on global resources needed to transition towards a greener economy. The act references several events that have spurred its development.

"Disruption in the supply of essential goods during the Covid-19 crisis and the energy crisis sparked by Russia's war of aggression against Ukraine have highlighted the EU's structural supply dependencies and their potentially damaging effects in times of crisis."

The EU also aims to catch up with China and the US in terms of recognising the importance of these materials. The US Inflation Reduction Act has been of particular worry in the EU, where industry bodies have warned that it could disadvantage the EU in the green transition. US president Joe

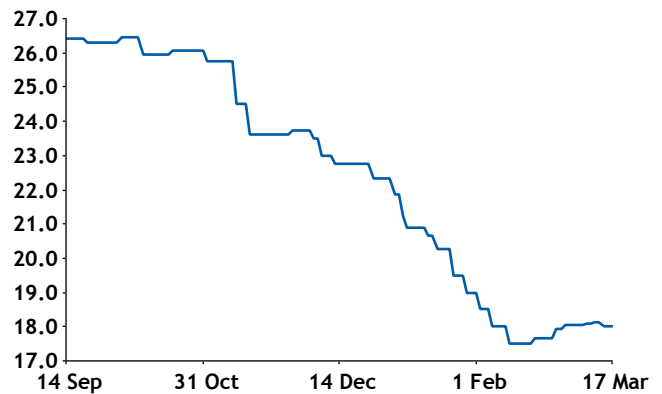
Biden and EU president Ursula Von Der Leyen met to discuss the act on 10 March.

The act will now go before the European Council and European Parliament before it passes into law.

By Thomas Kavanagh

Cobalt min 99.8% Alloy Grade du Rotterdam

\$/lb

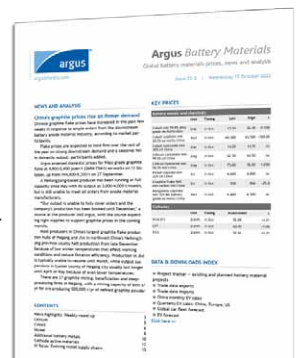


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## MINOR METALS: MARKET NEWS AND ANALYSIS

### PYX targets higher mid-term zircon demand

Australia-based zircon producer PYX Resources expects demand for zircon and titanium products to grow in 2023, providing opportunities to further increase its production capacity and market share.

PYX ramped up its output in 2022 in response to demand from applications including nuclear power, aerospace and catalytic converters.

PYX's revenue increased by 83pc to \$22.7mn in 2022 from \$12.4mn in 2021, the company reported yesterday. Its zircon revenue climbed by 81pc year on year, and it made its first sales of titanium dioxide minerals ilmenite and rutile as by-products of its zircon output.

PYX, which mines high-grade zircon in Indonesia, reported a 25pc increase in its zircon production over 2021 to 9,100t from 7,200t. The company sold all of that production, representing a 33pc increase over its 2021 zircon sales of 6,900t.

PYX's average annual zircon price rose by 36pc to \$2,457/t last year from \$1,811/t in 2021, and was up by 85pc from 2020. That reflects how the market has retreated from the 12-year highs reached in early 2022 but remains above 2021 levels. PYX had raised its premium zircon price by \$795/t to \$3,100/t in March 2022, a 34pc increase and its fifth consecutive rise since January 2021 for a gain of 135pc.

Zircon prices moved lower in the second half of last year, on a drop in demand from ceramics manufacturers in China and Europe, but the market has been rebounding so far this year. The *Argus* assessment for 65pc grade Hainan zircon sand has moved up to a 13,700-14,000 yuan/t range on an ex-works China basis, from Yn12,100-12,400/t in mid-December.

Over the medium term, PYX expects strong global demand for zircon owing to increased use in foundries and refractories, new nuclear power plant construction in Asia-Pacific, and accelerating use in surface coatings to drive demand.

The global zirconium market is projected to expand at a compound annual growth rate (CAGR) of 5pc in terms of volume from 2022 to 2027.

The nuclear industry in China is due to account for a large proportion of that growth, as there are 11 nuclear reactors under construction and another 43 planned. India has seven units under construction and 21 reactors expected to be brought on line by 2031.

China is expected to see the fastest CAGR to 2027 and account for around 50pc of the total revenue.

PYX expects the titanium market to grow at a rate of 6.4pc from 2021 to 2028, driving demand for its titanium

dioxide by-product. PYX started producing rutile in January 2022 and ilmenite in June 2022 to capitalise on the expected demand growth.

PYX produced 7,500t of titanium dioxide minerals last year and sold 3,000t. The rest of the material is held in its 7,300t of finished goods inventories, as the company is waiting to receive an export licence to start selling it internationally.

Increased use of titanium dioxide in pigments for paints and coatings formulation is a key market driver, as well as growing demand from the aerospace, aviation, shipping, offshore mining and petrochemicals industries. Titanium provides durability, strength and chemical resistance for a range of applications.

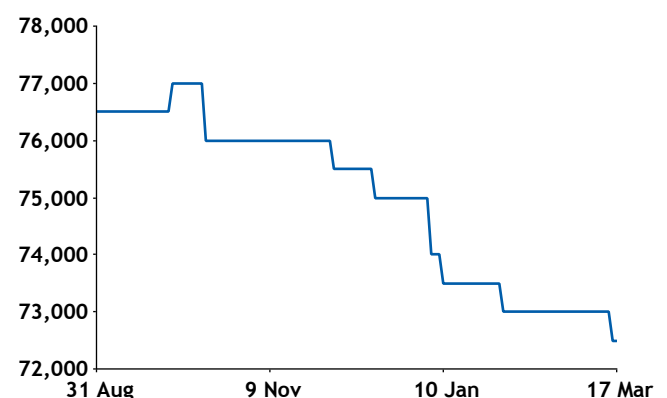
PYX said in December that it received a further investment of \$2.5mn from Australia-based L1 Capital Global Opportunities Master Fund to accelerate its plans to ramp up production at its Mandiri deposit and start planning operations at its Tisma deposit in Indonesia. L1 invested \$4.5mn in March last year.

PYX received a 10-year exploration and mining licence renewal for Tisma last month. The deposit contains 4.5mn t of inferred Zircon resources. The Tisma and Mandiri deposits combined have a total of 10.5mn t of zircon contained within 263.5mn t of heavy mineral sands.

PYX in November drew down the first \$400,000 from a \$20mn capital investment from US-based GEM Global Yield announced in October.

PYX started warehouse operations at Port Klang in Malaysia in November. Port Klang is the second-largest port in southeast Asia and the warehouse location will reduce PYX's shipping times by several weeks, cutting costs for consumers

Titanium sponge 99.7% Ti ex-works China Yn/t



in India, Europe and the Americas compared with shipping directly from Banjarmasin in Indonesia.

PYX aims to provide a buffer to limit the impact of seasonal storms and other supply chain issues that have hampered global supply chains, increasing the predictability of shipments and onward arrival times.

*By Nicole Willing*

### SiC manufacturers expand capacity investments

Silicon carbide (SiC) manufacturers are continuing to ramp up their production capacity in response to rising long-term demand for compound semiconductor technology.

Taiwan-based GlobalWafers said this week that it expects to complete construction and start mass production from its new 300mm (12-inch) silicon wafer plant in Texas, US, in the first quarter of 2025. The company expects semiconductor customers to begin refilling their inventories in the second quarter, leading to an increase in demand in the second half of the year.

GlobalWafers is investing in expanding its capacity in response to heavy investment in the electric vehicle (EV) market, as well as 5G telecommunication, data centre and renewable energy growth. GlobalWafers has been consolidating its production capacity in locations determined by customer demand based on shipping flexibility, geopolitical risks and carbon footprint. The company expects to receive financing support for the Texas plant from the US Creating Helpful Incentives to Produce Semiconductors (Chips) and Science Act.

In Japan, which is working to modernise and ramp up its semiconductor production, Mitsubishi Electric said this week that it will double its previously planned investment to ¥260bn (\$1.97bn) from ¥130bn by March 2026.

Most of the additional investment, around ¥100bn, will finance the construction of a new eight-inch SiC wafer plant in the Shisui area of Kumamoto prefecture. The company will also expand its production facilities for six-inch SiC wafers and invest around ¥10bn in a new factory that will consolidate operations that are dispersed throughout the Fukuoka area for the assembly and inspection of power semiconductors. The remaining ¥20bn of the new investment will be allocated to equipment upgrades, environmental enhancements and related operations.

In Sweden, SweGaN, which manufactures custom-made gallium nitride on silicon carbide (GaN-on-SiC) epitaxial wafers, said earlier this month that it is building a new headquarters including a high-capacity semiconductor production facility in Linköping, Sweden.

The facility will have the capacity to produce up to 40,000 wafers a year, which the company said will align with

accelerated global demand for GaN-on-SiC wafers used in 5G base stations, defence radars, low-orbit satellite communications and power switches for EVs. Completion of the plant is scheduled for the end of the second quarter.

The capacity expansions follow US-based Wolfspeed's announcement last month that it will build the world's largest 200mm SiC wafer fabrication facility in Saarland, Germany – its first in Europe. The facility will support growing demand for a range of automotive, industrial and energy applications, the company said. The project is subject to state aid approval from the European Commission as an Important Project of Common European Interest (IPCEI).

The plant is part of Wolfspeed's broader \$6.5bn capacity expansion, which includes its 200mm Mohawk Valley, US, device facility that was completed in April 2022, and the construction of The John Palmour Manufacturing Center for Silicon Carbide, under way in North Carolina, US, which will expand its materials capacity by more than tenfold.

The demand growth is evident along the supply chain. Aehr Test Systems, which supplies semiconductor test and reliability qualification equipment, said this week that it has received a \$6.7mn order from an unnamed lead SiC customer for equipment to meet its increased production capacity needs for SiC power semiconductors for the EV market.

*By Nicole Willing*

### Chinese steelmakers cut March Mn tender prices

Chinese stainless steel producers reduced their manganese tender procurement prices for March delivery in response to lower steel demand and increased manganese flake supplies.

Baosteel, the country's biggest manganese flake consumer, cut its provisional tender price for 2,000t of manganese flake to 15,700 yuan/t (\$2,279/t) on a delivered basis and paid by acceptance bill this week, down by Yn200/t from a tender it issued at the end of February.

China's major private-sector steel company Shagang also reduced its tender price for nearly 1,000t of manganese flake to Yn15,500/t on a delivered basis, paid half by acceptance bill and half by cash, down by Yn100/t from a tender it issued in mid-February.

Spot prices for 99.7pc grade manganese flake were assessed at Yn15,100-15,200/t ex-works on 17 March, down from Yn15,200-15,300/t on 14 March. Prices began to soften at the start of March following a rise in spot supplies, as the country's manganese industry alliance did not introduce further production cut plans. This was coupled with lower tenders from stainless steel producers. The manganese industry alliance has also begun to purchase manganese flake from the spot market for storage at its public warehouses in the past two days, in a bid to support prices.



## China's Xianglu lowers 1H March W bid prices

Chinese tungsten primary material consumer Xianglu Tungsten has reduced its first-half March bid prices in line with lower spot prices and flat downstream demand.

Xianglu's first-half March bid price for 88.5pc grade ammonium paratungstate (APT) fell by 3,500 yuan/t (\$509/t) from second-half February to Yn176,500/t. Its bid price for 55pc wolframite concentrate dipped by Yn2,500/t to Yn115,500/t over the same period.

Its 88.5pc grade ammonium paratungstate (APT) bid prices are lower than those of rival Zhangyuan and Xiamen Tungsten, further dampening market confidence as term contracts dominate market activity.

Xianglu operates a complete tungsten production chain from concentrate to cemented carbide products. The company predicts a Yn30mn-45mn of profit loss for the whole of 2022 because of higher feedstock costs and slow rises in the sales prices of its products. The firm signs term contracts with several concentrate suppliers to guarantee its feedstock availability. It also buys a certain amount of APT for its downstream product production if the concentrate amount is unable to meet its demand.

Xiamen Tungsten cut its first-half March APT bid price to Yn177,000/t on 7 March from Yn179,000/t in the second half of February. Fellow consumer Zhangyuan Tungsten set its bid price lower by Yn2,000/t at Yn178,000/t during the same period. Primary tungsten producer Jiangxi Tungsten lowered its offer price for 65pc grade concentrate to Yn120,000/t from Yn120,500/t over the same period.

The tungsten market in China has seen some declines in March because of slow demand both in the domestic and export market. Argus assessed prices for 55pc grade wolframite concentrate stable at Yn116,500-117,500/t ex-works on 16 July following a combined fall of Yn1,500/t during 7-14 March. The range for 88.5pc grade APT was assessed flat at Yn177,00-178,000/t ex-works on 16 March following a total fall of Yn2,500/t during 7-14 March.

There is further downside potential next week as APT prices could go as low as Yn176,000-176,500/t in the spot market, according to market participants.

## China's Kuntian to launch anode plant in Yunnan

Chinese anode material producer Hebei Kuntian is on track to launch the first phase of its plant in Yuxi city in south China's Yunnan province in April.

The first phase has a designed capacity of 50,000 t/yr of anode materials used in lithium-ion battery. The second phase with a designed capacity of 160,000 t/yr has started site construction, scheduled to complete in 2025.

Kuntian started a 50,000 t/yr plant in Suining city in southwest China's Sichuan province in July 2022. It also has

Bid prices for 88.5pc APT			Yn/t
Period	Xiamen Tungsten	Zhangyuan Tungsten	Xianglu Tungsten
1H November	165,000	165,000	164,500
2H November	164,500	165,000	166,000
1H December	168,000	168,500	172,000
2H December	172,000	172,000	175,000
1H January	176,000	176,500	177,000
1H February	181,000	182,000	180,000
2H February	179,000	180,000	180,000
1H March	177,000	178,000	176,500

– Xianglu Tungsten

two plants with a total capacity of 80,000 t/yr in Inner Mongolia and Hebei provinces, for an overall capacity of 130,000 t/yr.

Kuntian is a long-term feedstock supplier for lithium-ion battery and anode material producers, such as SVOLT, EVE, BTR, Gotion High-Tech, Shanshan and Zichen.

China's new energy vehicle (NEV) production and sales rebounded in February following the end of the lunar new year holiday.

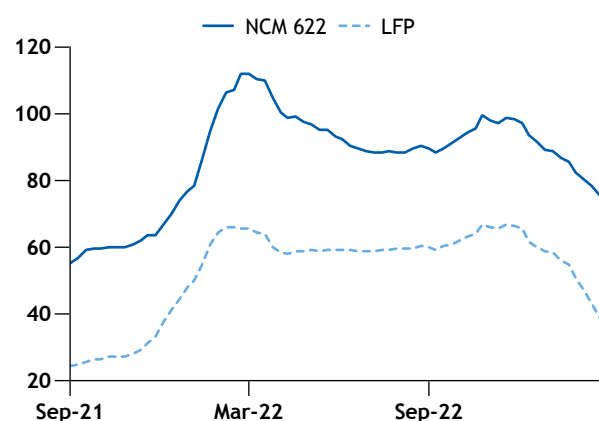
China produced **552,000 NEVs** in February, up by 49pc from a year earlier, with sales rising by 56pc, according to data from the China Association of Automobile Manufacturers (CAAM).

China expects emissions to peak by 2030. The country aims to achieve net zero by 2060, which have boosted its EV sales significantly, with the country leading global growth in the past decade. CAAM predicts that the country's NEV sales will rise to 9mn units this year, an increase of around 30pc from 2022.

Argus forecasts that global lithium-ion battery demand will reach 4.1TWh by 2032. This is expected to support de-

Cathode chemistries LFP vs NCM 622

\$/kwh



mand for lithium-ion battery feedstocks such as cathode and anode materials, market participants said.

**Aircraft financing needs to grow: Boeing**

Boeing expects that aircraft financing needs will hit pre-pandemic levels in 2023 to fund rising airplane production and deliveries.

Boeing forecast that domestic commercial air travel could recover to pre-pandemic levels by 2023 or 2024 with international traffic gaining momentum in parallel with an easing of restrictions.

Boeing refrained from providing more detailed guidance on 2023, citing geopolitical and economic uncertainties.

Boeing's North American customers funded 69pc of their aircraft purchases with cash funding – the most of all regions – in 2022, Boeing said, as a result of their strong cash flow positions and operational performances.

Regarding European operators, deliveries were funded 43pc by cash, with capital markets and bank debt accounting for a further 25pc and 20pc, respectively.

Lastly, Chinese buyers relied 30pc on cash financing with 58pc of purchases drawing on bank debt in 2022.

The company's forecast for 2023 continued to list cash payment as a significant portion of delivery financing.

**Financing plan**

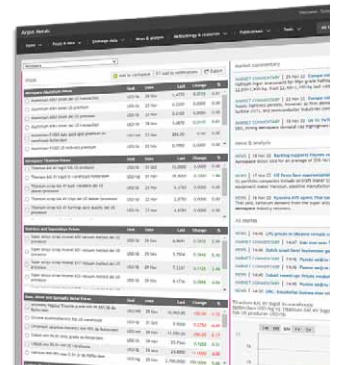
As aircraft purchases could become more difficult as the US Federal Reserve has hiked its target rate in the last year at the fastest pace since the 1980s to combat inflation. That has pushed up all commercial financing costs from decade-long lows.

*By Deyzhah Knox*



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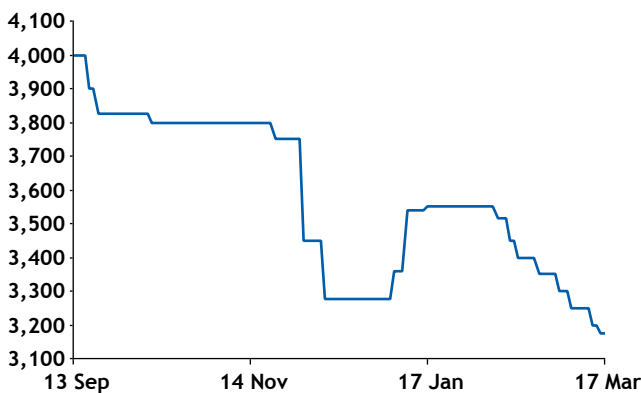
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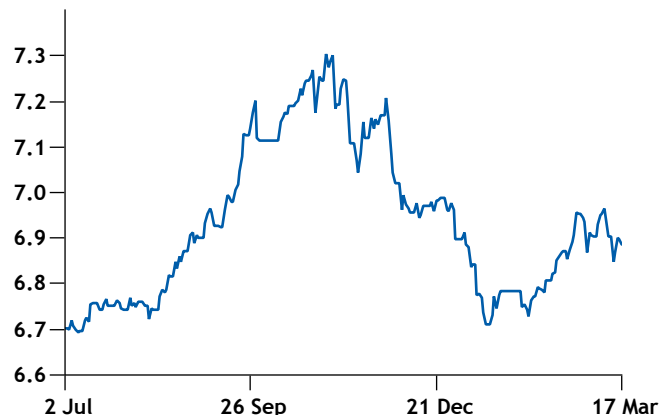
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Magnesium min 99.9% du Rotterdam \$/t

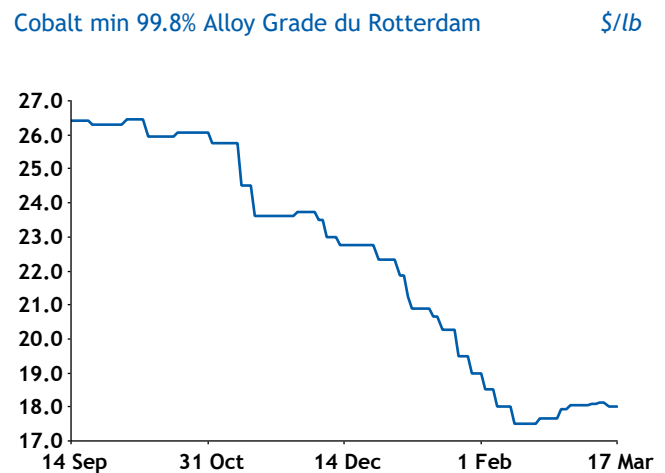


USD v CNY



Battery metals price assessments					
	Unit	17 Mar		± Date	±
		Low	High		
<b>Antimony</b>					
Ingot min 99.65% ex-works China	Yn/t	84,500	85,500	16 Mar	nc
Ingot min 99.65% fob China	\$/t	13,000	13,300	16 Mar	nc
Min 99.85% ex-works China	Yn/t	85,500	86,500	16 Mar	nc
Regulus grade II min 99.65% Sb du Rotterdam	\$/t	12,450	12,950	16 Mar	nc
Regulus Trioxide grade min 99.65% Sb du Rotterdam	\$/t	12,450	12,950	16 Mar	nc
Trioxide min 99.5% ex-works China	Yn/t	74,000	75,000	16 Mar	nc
Trioxide min 99.5% fob China	\$/t	10,800	11,000	16 Mar	nc
Trioxide min 99.8% ex-works China	Yn/t	75,000	76,000	16 Mar	nc
Trioxide min 99.8% fob China	\$/t	11,000	11,200	16 Mar	nc
<b>Cadmium</b>					
Min 99.99% du Rotterdam	\$/lb	2.20	2.35	16 Mar	nc
Min 99.99% ex-works China (14 Mar)	Yn/t	29,200	29,500	7 Mar	+1,000
Min 99.99% cif India	Rs/kg	370.00	375.00	16 Mar	nc
Min 99.95% du Rotterdam	\$/lb	2.00	2.25	16 Mar	nc
Min 99.95% cif India	Rs/kg	370.00	375.00	16 Mar	nc
Oxide min 99.5% ex-works China (14 Mar)	Yn/t	29,700	30,000	7 Mar	+1,000
<b>Cobalt</b>					
(Electrolytic metal) min 99.8% ex-works China	Yn/kg	278	340	16 Mar	nc
Chloride min 24% ex-works China	Yn/t	50,500	52,000	16 Mar	nc
Cobalt min 99.8% alloy grade du Rotterdam	\$/lb	17.40	18.60	16 Mar	nc
Cobalt min 99.8% chemical grade du Rotterdam	\$/lb	16.25	17.25	16 Mar	nc
Cobalt hydroxide min 30% cif China	\$/lb	9.40	9.90	16 Mar	nc
Oxide 72% ex-works China	Yn/kg	170	175	16 Mar	nc
Powder min 99.8% ex-works China	Yn/kg	280	290	16 Mar	nc
Cobalt sulphate min 20.5% ex-works China	Yn/t	42,000	43,500	16 Mar	nc
Sulphate min 20.5% ex-works China excl. VAT USD/lb	\$/lb	2.45	2.53	16 Mar	+0.00
Tetroxide min 73% ex-works China	Yn/kg	172	177	16 Mar	nc
<b>Graphite</b>					
Flake 94% carbon ex-works China (14 Mar)	Yn/t	4,800	5,100	7 Mar	nc
Graphite Flake 94% carbon fob China (14 Mar)	\$/t	770	820	7 Mar	nc
<b>Lithium</b>					
Carbonate min 99.5% ex-works China	Yn/t	295,000	320,000	16 Mar	-4,000
Carbonate min 99.5% ex-works China excl. VAT USD/kg	\$/kg	37.88	41.09	16 Mar	-0.48
Lithium carbonate min 99.5% cif China	\$/kg	43.00	45.00	16 Mar	nc
Lithium cobalt oxide min 60% Co ex-works China	Yn/kg	290	320	16 Mar	nc
Hydroxide min 56.5% ex-works China	Yn/t	360,000	400,000	16 Mar	-2,500
Hydroxide min 56.5% ex-works China excl. VAT USD/kg	\$/kg	46.23	51.37	16 Mar	-0.27
Lithium hydroxide min 56.5% fob China	\$/kg	67.00	68.00	16 Mar	nc
<b>Manganese</b>					
Manganese sulphate min 32% Mn battery grade ex works China (14 Mar)	Yn/t	6,400	6,500	7 Mar	nc
Dioxide min 91% carbon battery grade ex works China (14 Mar)	Yn/t	16,200	16,700	7 Mar	nc
Dioxide min 91% alkaline battery grade ex works China (14 Mar)	Yn/t	17,200	17,700	7 Mar	nc
Dioxide min 91% carbon battery grade ex works China excl. VAT USD/t (14 Mar)	\$/t	2,085	2,149	7 Mar	+18
Dioxide min 91% alkaline battery grade ex works China excl. VAT USD/t (14 Mar)	\$/t	2,214	2,278	7 Mar	+19

Battery cathode active materials				
	Unit	Timing	Mid	±
NCM111	\$/kWh	14 Mar	74.39	-2.64
NCM523	\$/kWh	14 Mar	75.45	-2.64
NCM622	\$/kWh	14 Mar	75.75	-2.63
NCM811	\$/kWh	14 Mar	80.36	-2.59
NCA	\$/kWh	14 Mar	80.08	-2.59
LFP	\$/kWh	14 Mar	38.91	-4.33
<b>Averages</b>				
NCM111 MTD	\$/kWh	14 Mar	74.39	-2.64
NCM111 monthly average	\$/kWh	28 Feb	78.81	-8.52
NCM523 MTD	\$/kWh	14 Mar	75.45	-2.64
NCM523 monthly average	\$/kWh	28 Feb	80.07	-8.40
NCM622 MTD	\$/kWh	14 Mar	75.75	-2.63
NCM622 monthly average	\$/kWh	28 Feb	80.45	-8.34
NCM811 MTD	\$/kWh	14 Mar	80.36	-2.59
NCM811 monthly average	\$/kWh	28 Feb	85.14	-8.26
NCA MTD	\$/kWh	14 Mar	80.08	-2.59
NCA monthly average	\$/kWh	28 Feb	84.86	-8.25
LFP MTD	\$/kWh	14 Mar	38.91	-4.33
LFP monthly average	\$/kWh	28 Feb	47.28	-10.94



Electronic metals price assessments					
	Unit	17 Mar		± Date	±
		Low	High		
<b>Bismuth</b>					
Min 99.99% du Rotterdam	\$/lb	3.95	4.50	16 Mar	nc
Min 99.99% ex-works China	Yn/t	54,000	55,000	16 Mar	nc
Min 99.99% fob China	\$/lb	3.56	3.65	16 Mar	nc
<b>Gallium</b>					
Min 99.9999% ex-works China (14 Mar)	Yn/kg	2,100	2,200	7 Mar	-50
Min 99.9999% fob China (14 Mar)	\$/kg	285	300	7 Mar	-10
Min 99.99% ex-works China	Yn/kg	1,760	1,810	16 Mar	nc
Min 99.99% fob China	\$/kg	255	265	16 Mar	nc
Min 99.99% cif Main Airport	\$/kg	280	290	16 Mar	nc
<b>Germanium</b>					
Dioxide min 99.999% ex-works China	Yn/kg	5,800	5,900	16 Mar	nc
Dioxide min 99.999% fob China	\$/kg	850	900	16 Mar	nc
Dioxide min 99.999% cif main airport Europe	\$/kg	800	860	16 Mar	nc
Metal (zone refined ingot) min 99.999% ex-works China	Yn/kg	8,800	8,900	16 Mar	nc
Metal min 99.999% cif main airport Europe	\$/kg	1,260	1,320	16 Mar	nc
Min 99.999% fob China	\$/kg	1,290	1,390	16 Mar	nc
<b>Indium</b>					
Min 99.99% du Rotterdam	\$/kg	220	240	16 Mar	nc
Min 99.99% ex-works China	Yn/kg	1,470	1,520	16 Mar	nc
Indium min 99.99% fob China	\$/kg	218	228	16 Mar	nc
Min 99% ex-works China	Yn/kg	1,420	1,520	16 Mar	nc
<b>Selenium</b>					
Dioxide min 98% del China consumer	Yn/kg	110.00	120.00	16 Mar	nc
Min 99.5% du Rotterdam	\$/lb	6.30	8.50	16 Mar	nc
Powder min 99.9% del China consumer	Yn/kg	165.00	175.00	16 Mar	nc
<b>Tantalum</b>					
Pentoxide min 99.5% ex-works China (14 Mar)	Yn/kg	1,920	2,020	7 Mar	+20
Tantalite basis 25% Ta <sub>2</sub> O <sub>5</sub> cif main port	\$/lb	106.00	110.00	16 Mar	nc
Min 99.8% du Rotterdam	\$/kg	385	400	16 Mar	nc
<b>Tellurium</b>					
99.99% ex-works China (14 Mar)	Yn/kg	590	600	7 Mar	+10
Min 99.99% du Rotterdam	\$/kg	71.00	82.00	16 Mar	nc
<b>Zirconium</b>					
Carbonate 40% Zr (Hf)O <sub>2</sub> 0.2% Cl ex-works China (14 Mar)	Yn/t	25,000	25,500	7 Mar	nc
Carbonate 40% Zr (Hf)O <sub>2</sub> 0.2% Cl fob China (14 Mar)	\$/t	3,700	3,770	7 Mar	nc
Carbonate 40% Zr (Hf)O <sub>2</sub> 0.005% Cl ex-works China (14 Mar)	Yn/t	26,000	26,500	7 Mar	nc
Carbonate 40% Zr (Hf)O <sub>2</sub> 0.005% Cl fob China (14 Mar)	\$/t	3,850	3,920	7 Mar	nc
Fused zirconia 98.5% ZrO ex-works China (14 Mar)	Yn/t	37,500	38,500	7 Mar	nc
Oxychloride 36% Zr(Hf)O <sub>2</sub> ex-works China (14 Mar)	Yn/t	18,000	18,500	7 Mar	nc
Oxychloride 36% Zr(Hf)O <sub>2</sub> fob China (14 Mar)	\$/t	2,670	2,750	7 Mar	nc
Silicate 65% Zr(Hf)O <sub>2</sub> ex-works China (14 Mar)	Yn/t	18,000	18,300	7 Mar	nc
Sponge 99.4% Zr+Hf ex-works China (14 Mar)	Yn/kg	200.00	215.00	7 Mar	-5.00



High-temperature metals price assessments					
	Unit	17 Mar		± Date	±
		Low	High		
<b>Chromium</b>					
(alumino-thermic) min 99% dp Rotterdam	\$/t	10,100	11,600	16 Mar	nc
(aluminothermic) min 99% Cr fob China	\$/t	10,000	10,800	16 Mar	nc
(aluminothermic) min 99% Cr ex-works China	Yn/t	70,000	75,000	16 Mar	nc
<b>Hafnium</b>					
Min 99% max 0.5% Zr du Rotterdam (14 Mar)	\$/kg	5,000	5,300	7 Mar	nc
<b>Molybdenum</b>					
Ingot min 99.8% in-warehouse Rotterdam (14 Mar)	\$/kg	92.00	100.00	7 Mar	-1.00
Concentrates Mo 45% ex-works China	Yn/mtu	4,300	4,330	16 Mar	-70
Roasted concentrates (oxide) min 57% ex-works China	Yn/mtu	4,400	4,430	16 Mar	-70.00
Oxide min 57% Mo in-warehouse Busan	\$/lb	30	31	16 Mar	nc
Oxide min 57% Mo du Rotterdam	\$/lb Mo	31.50	32.00	16 Mar	nc
Oxide min 57% Mo duty paid India	Rs/kg Mo	3,500	3,550	16 Mar	nc
<b>Niobium</b>					
Ingot min 99.8% in-warehouse Rotterdam (01 Mar)	\$/kg	83.00	86.00	1 Feb	nc
Pentoxide min 99.5% ex-works China (14 Mar)	Yn/kg	282	292	7 Mar	+2
(columbite) concentrate min 50% Nb <sub>2</sub> O <sub>5</sub> cif main port	\$/lb	16.50	17.75	16 Mar	nc
<b>Rhenium</b>					
APR min 69.2% Re (basic grade) du Rotterdam (14 Mar)	\$/kg Re	750	850	7 Mar	nc
APR min 69.4% Re (catalyst grade) dp Rotterdam (14 Mar)	\$/kg Re	900	1,050	7 Mar	nc
APR min 69.4% Re ex-works China (14 Mar)	Yn/kg	3,600	4,100	7 Mar	nc
Pellets min 99.9% Re dp Rotterdam (14 Mar)	\$/lb	500	600	7 Mar	nc
<b>Tungsten</b>					
APT du Rotterdam	\$/mtu WO <sub>3</sub>	330	335	16 Mar	nc
Tungsten APT fob China	\$/mtu WO <sub>3</sub>	322	327	16 Mar	nc
APT min 88.5% ex-works China	Yn/t	177,000	178,000	16 Mar	nc
Carbide min 99.7% ex-works China	Yn/kg	266	268	16 Mar	nc
Carbide powder (3-4micron) fob China	\$/kg	40.00	41.00	16 Mar	nc
Ingot min 99.9% in-warehouse Rotterdam (14 Mar)	\$/kg	41.00	43.00	7 Mar	nc
Oxide (Yellow/Blue oxide) fob China	\$/t	32,700	33,200	16 Mar	nc
Oxide min 99.95% ex-works China	Yn/t	204,000	206,000	16 Mar	nc
Concentrates 55% min ex-works China	Yn/t	116,500	117,500	16 Mar	nc
Concentrates min 65% ex-works China	Yn/t	118,000	119,000	16 Mar	nc
Concentrates min 65% in-warehouse Rotterdam	\$/dmu	270	280	16 Mar	nc
<b>Vanadium</b>					
Pentoxide fused flake min 98% du Rotterdam (14 Mar)	\$/lb V <sub>2</sub> O <sub>5</sub>	10.50	11.25	7 Mar	nc
Pentoxide 98% V <sub>2</sub> O <sub>5</sub> fob China	\$/lb	9.50	10.20	16 Mar	nc
Pentoxide 98% V <sub>2</sub> O <sub>5</sub> ex-works China	Yn/t	136,000	138,000	16 Mar	+500

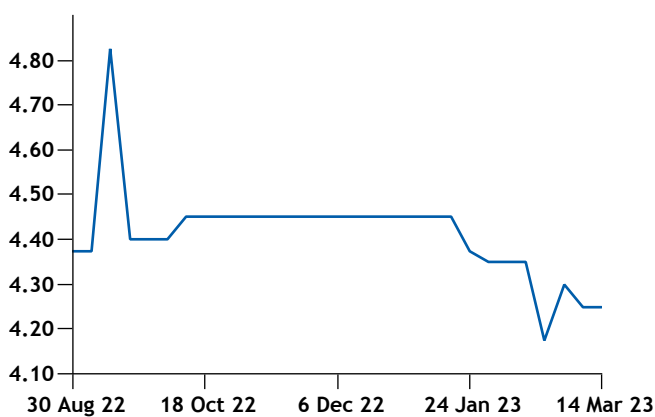
Mineral sands price assessments					
	Unit	14 Mar		± Date	±
		Low	High		
<b>Rutile</b>					
Rutile Hainan min 90% TiO <sub>2</sub> ex-works China	Yn/t	12,200	12,800	7 Mar	nc
Rutile Australian min 95% TiO <sub>2</sub> ex-works China	Yn/t	15,800	16,300	7 Mar	nc
<b>Zircon sand</b>					
Zircon sand Hainan min 65% O <sub>2</sub> ex-works China	Yn/t	13,700	14,000	7 Mar	nc
Zircon sand Australian min 66% O <sub>2</sub> cif China	\$/t	2,255	2,285	7 Mar	nc

Light metals price assessments					
	Unit	17 Mar		± Date	±
		Low	High		
<b>Magnesium</b>					
Alloy min 90% Mg AZ91 ex-works China	Yn/t	22,100	22,400	16 Mar	-100
Alloy min 90% Mg AZ91 fob China	\$/t	3,240	3,290	16 Mar	-20
Min 99.9% du Rotterdam	\$/t	3,100	3,250	16 Mar	nc
Min 99.9% ex-works China	Yn/t	20,100	20,400	16 Mar	-100
Min 99.9% fob China	\$/t	3,000	3,050	16 Mar	-20
Powder 99.9% Mg 20-80 mesh ex-works China	Yn/t	21,600	21,900	16 Mar	-100
Powder 99.9% Mg 20-80 mesh fob China	\$/t	3,140	3,190	16 Mar	-20
<b>Manganese</b>					
Briquette min 97% Mn ex-works China	Yn/t	15,900	16,000	16 Mar	nc
Briquette 97% Mn fob China	\$/t	2,250	2,300	16 Mar	nc
Flake 99.7% Mn ex-works China	Yn/t	15,100	15,200	16 Mar	nc
Flake min 99.7% fob China	\$/t	2,200	2,250	16 Mar	nc
Flake min 99.7% du Rotterdam	\$/t	2,370	2,470	16 Mar	nc
Lump min 95% Mn ex-works China	Yn/t	15,600	15,700	16 Mar	nc
Lump 95% Mn fob China	\$/t	2,270	2,320	16 Mar	nc
<b>Silicon</b>					
5-5-3 min 98.5% Si dat Chinese ports	Yn/t	16,400	16,700	16 Mar	nc
5-5-3 min 98.5% Si fob China	\$/t	2,390	2,440	16 Mar	nc
5-5-3 min 98.5% Si ddp Europe works	€/t	2,850	3,000	16 Mar	nc
5-5-3 min 98.5% Si fca duty paid Rotterdam within 90 days (16 Mar)	€/t	2,850	3,000	9 Mar	-25
4-4-1 min 99% Si dat Chinese ports	Yn/t	17,300	17,600	16 Mar	nc
4-4-1 min 99% Si fob China	\$/t	2,530	2,580	16 Mar	nc
4-4-1 min 99% Si ddp Europe works	€/t	3,000	3,200	16 Mar	nc
3-3-0-3 min 99% Si dat Chinese ports	Yn/t	17,800	18,100	16 Mar	nc
3-3-0-3 min 99% Si fob China	\$/t	2,600	2,650	16 Mar	nc
3-3-0-3 min 99% Si fca Europe works	€/t	3,300	3,500	16 Mar	nc
2-2-0-2 min 99.5% Si dat Chinese ports (16 Mar)	Yn/t	30,300	30,800	9 Mar	nc
2-2-0-2 min 99.5% Si fob China (16 Mar)	\$/t	4,430	4,480	9 Mar	nc
2-2-0-2 min 99.5% Si fca Europe works	€/t	3,800	4,000	16 Mar	nc
<b>Titanium</b>					
Concentrate 50% TiO <sub>2</sub> ex-works China (VAT unpaid)	Yn/t	1,950	2,000	16 Mar	nc
Concentrate 46% TiO <sub>2</sub> ex-works China (VAT unpaid)	Yn/t	2,200	2,220	16 Mar	nc
Concentrate Vietnamese A grade min 50% TiO <sub>2</sub> FOB China warehouse (16 Mar)	\$/t	370.00	390.00	9 Mar	nc
Concentrate Vietnamese B grade min 54% TiO <sub>2</sub> FOB China warehouse (16 Mar)	\$/t	350.00	370.00	9 Mar	nc
Concentrate Mozambique origin min 50% TiO <sub>2</sub> CIF China (16 Mar)	\$/t	400.00	415.00	9 Mar	nc
Concentrate Australia origin min 50% TiO <sub>2</sub> CIF China (16 Mar)	\$/t	390.00	410.00	9 Mar	nc
Dioxide 93pc min rutile grade ex-works China	Yn/t	15,500	16,500	16 Mar	nc
Dioxide 93pc min rutile grade fob China	\$/t	2,300	2,350	16 Mar	nc
Dioxide 98pc min anatase grade ex-works China	Yn/t	14,500	15,000	16 Mar	nc
Ingot min 99% Ti pure TA1 ex-works China (14 Mar)	Yn/t	82,000	84,000	7 Mar	nc
Ingot min 99% Ti pure TA2 ex-works China (14 Mar)	Yn/t	81,000	82,000	7 Mar	nc
Ingot min 99% Ti pure TA3 ex-works China (14 Mar)	Yn/t	83,000	85,000	7 Mar	nc
6Al 4V ingot fob US producer (28 Feb)	\$/lb	12.00	12.50	31 Jan	-0.75
Ingot CP Grade 1 fob Rotterdam USD/kg (01 Mar)	\$/kg	11.30	11.90	1 Feb	nc
Ingot CP Grade 2 fob Rotterdam USD/kg (01 Mar)	\$/kg	10.90	11.30	1 Feb	nc
Slab CP Grade 1 fob Rotterdam USD/kg (01 Mar)	\$/kg	11.50	12.00	1 Feb	nc
Slab CP Grade 2 fob Rotterdam USD/kg (01 Mar)	\$/kg	11.00	11.50	1 Feb	nc
Slag min 92% TiO <sub>2</sub> ex-works China	Yn/t	9,100	9,400	16 Mar	nc
Sponge 99.7% Ti ex-works China	Yn/t	71,000	74,000	16 Mar	nc
Sponge 99.6% Ti ex-works China	Yn/t	70,000	73,000	16 Mar	nc
Sponge TG-Tv 10x30mm du Rotterdam	\$/kg	7.60	8.10	16 Mar	nc
Tetrachloride min 99.9% TiCl <sub>4</sub> ex-works China	Yn/t	7,300	7,600	16 Mar	nc

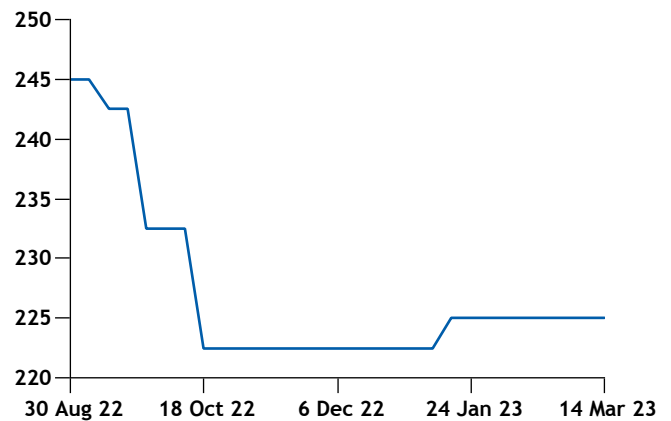
Weekly US price assessments							
Metal	Unit	17 Mar		±	10 Mar		±
		Low	High		Low	High	
<b>Electronic metals</b>							
<b>Bismuth</b>							
Bismuth Ingot min 99.99% fob US warehouse (14 Mar)	\$/lb	4.05	4.45	nc	4.05	4.45	-0.05
<b>Indium</b>							
Ingot min 99.99% fob US warehouse (14 Mar)	\$/kg	220.00	230.00	nc	220.00	230.00	nc
<b>Selenium</b>							
Selenium min 99.5% fob US warehouse (14 Mar)	\$/lb	10.00	11.00	nc	10.00	11.00	nc
<b>Tantalum</b>							
Scrap 99.9% vacuum melted del US consumer (14 Mar)	\$/lb	170.00	180.00	nc	170.00	180.00	nc
<b>Tellurium</b>							
Min 99.95% fob US warehouse (14 Mar)	\$/kg	77.00	82.00	nc	77.00	82.00	nc
<b>Battery metals price assessments</b>							
<b>Antimony</b>							
Min 99.65% cif US (14 Mar)	\$/lb	5.500	5.750	nc	5.500	5.750	-0.300
<b>Cadmium</b>							
Min 99.99% fob US warehouse (14 Mar)	\$/lb	2.60	2.70	nc	2.60	2.70	nc
Min 99.95% fob US warehouse (14 Mar)	\$/lb	2.50	2.60	nc	2.50	2.60	nc
<b>Cobalt</b>							
Min 99.8% fob US warehouse (14 Mar)	\$/lb	18.50	19.50	nc	18.50	19.50	+0.25
<b>Light metals price assessments</b>							
<b>Magnesium</b>							
Min 99.9% fob US warehouse (14 Mar)	\$/t	11,023	12,125	nc	11,023	12,125	nc
<b>Manganese</b>							
Electrolytic metal min 99.7% fob US warehouse (16 Mar)	\$/lb	1.40	1.65	nc	1.40	1.65	nc
<b>Silicon</b>							
5-5-3 min 98.5% Si fob US warehouse (14 Mar)	\$/lb	1.950	2.200	nc	1.950	2.200	-0.075
5-5-3 min 98.5% Si fob US warehouse 90 days (14 Mar)	\$/lb	1.900	2.100	nc	1.900	2.100	-0.050
<b>Titanium</b>							
Scrap 6Al 4V bulk weldable del US dealer/processor (16 Mar)	\$/lb	5.10	5.65	nc	5.10	5.65	nc
Scrap 6Al 4V clips del US dealer/processor (16 Mar)	\$/lb	3.30	3.60	nc	3.30	3.60	nc
Scrap grade CP1 solids del US dealer/processor (16 Mar)	\$/lb	3.50	3.75	nc	3.50	3.75	nc
Scrap grade CP2 solids del US dealer/processor (16 Mar)	\$/lb	3.30	3.50	nc	3.30	3.50	nc
Scrap grade CP3/4 solids del US dealer/processor (16 Mar)	\$/lb	2.50	2.70	nc	2.50	2.70	nc
Scrap 6Al 4V turnings aero quality del US processor (16 Mar)	\$/lb	4.00	4.50	nc	4.00	4.50	-0.25
<b>High-temperature metals price assessments</b>							
<b>Molybdenum</b>							
Oxide min 57% fob US warehouse (16 Mar)	\$/lb	33.000	34.000	nc	33.000	34.000	nc

Monthly US price assessments							
Metal	Unit	28 Feb			31 Jan		
		Low	High	±	Low	High	±
<b>Arsenic</b>							
Min 99% fob US warehouse	\$/lb	1.95	2.15	nc	1.95	2.15	nc
<b>Chromium</b>							
(aluminothermic) fob US warehouse	\$/lb	5.15	5.35	-0.25	5.40	5.60	-0.05
<b>Molybdenum</b>							
Scrap 99.7% airmelt del US consumer	\$/lb	43.00	44.00	+9.00	34.00	35.00	+9.00
Scrap 99.9% pure vacuum del US processor	\$/lb	37.00	41.00	+6.00	32.00	34.00	+6.50
<b>Niobium</b>							
(columbium) scrap vacuum del US consumer	\$/lb	42.00	44.00	nc	42.00	44.00	+2.50
(columbium) scrap vacuum del US processor	\$/lb	32.00	33.00	nc	32.00	33.00	+1.00
<b>Rhenium</b>							
APR catalyst 69.4% fob US warehouse	\$/lb	435	475	nc	435	475	+40.0
99.9% fob US warehouse	\$/lb	470	515	+2	465	515	nc
<b>Titanium</b>							
6Al 4V ingot fob US producer	\$/lb	12.00	12.50	-0.75	12.50	13.50	nc
<b>Tungsten</b>							
99.9% min Chinese bar del US consumer	\$/lb	21.35	21.60	+0.73	20.50	21.00	-0.25
Carbide scrap inserts fob US processor	\$/lb	9.75	10.50	+0.50	9.25	10.00	+0.62
Carbide scrap rounds fob US processor	\$/lb	9.75	10.50	+0.50	9.25	10.00	+0.62
99.9% scrap solids consumer price fob US processor	\$/lb	21.00	21.50	+0.75	20.00	21.00	-0.50
99.9% scrap del US processor	\$/lb	18.00	19.00	+1.00	17.00	18.00	nc

Bismuth ingot min 99.99% fob US warehouse \$/lb



Indium ingot min 99.99% fob US warehouse \$/kg



## BASE METALS: MARKET COMMENTARY

### Metal futures: Markets higher in final session

Base metal prices recovered in official trading on the London Metal Exchange (LME) this morning after two days of decline triggered by fears of a banking crisis.

Switzerland-based investment bank Credit Suisse recovered the value of its shares yesterday after it received financial support from the country's central bank.

This has helped calm the turmoil in the banking sector, which began in the US with the collapse of California-based Silicon Valley Bank on 10 March and New York-based Signature Bank two days later.

The European Central Bank (ECB) raised its benchmark interest rate by half a percentage point yesterday in its mission to tame inflation.

Base metals received some support from a weakening US dollar today. The US dollar index, which measures the currency against six of its peers, stood at 104.19 today, from 104.45 yesterday.

The US Federal Reserve will decide on the size of its next interest rate hike next week. It is expected that it will raise the benchmark rate by a quarter of a percentage point.

Three-month LME copper prices rose by 1pc to \$8,624/t, while Comex's next most active month copper contract increased by 0.7pc to \$3.90/lb. Copper futures were lower in the last week with Comex's May contract dropped by 3.4pc and the LME contract fell by 1.7pc since closing on 10 March.

Three-month LME aluminum dropped by 0.3pc to \$2,280/t. Aluminum was the only base metal to find lower prices today.

Russian aluminum producer Rusal saw its profits reduced because of sanctions, it said. The Australian government's ban on exports of alumina and aluminum ores to Russia forced Rusal to look for alternative suppliers.

Three-month LME nickel prices rose by 3pc to \$23,550/t, while three-month LME lead edged up by 0.2pc to \$2,069/t.

Global equities were higher in the morning but lower throughout the afternoon. In Asia, Hong Kong's Hang Seng gained 1.6pc as Tokyo's Nikkei 225 rose by 1.2pc this morning. In Europe, the German DAX fell by 1.4pc while London's FTSE 100 dipped by 1pc at closing.

Meanwhile in the US, the S&P 500 declined by 1.4pc and the Dow Jones dropped by 1.5pc during midday trading. US equities were mixed with Dow Jones Industrial average falling by 0.4pc and the S&P 500 gaining 1.2pc since closing on 10 March

WTI, the US crude benchmark, fell by 2.4pc to \$66.74/bl.

Three-month LME zinc prices climbed by 1.9pc to \$2,905/t, with three-month LME tin rising by 1.1pc to \$22,500/t. Brazilian mining company Nexa announced a rise in mineral reserves in its Mato Grosso mine, with [proven reserves of zinc estimated at 273,400t](#).

Aluminium					
	Unit	Date of assessment	Low	High	±
<b>Premiums</b>					
P1020 US midwest premium	\$/lb	15 Mar	0.2750	0.2850	-0.0100
P1020 US midwest premium monthly avg	\$/lb	28 Feb	0.2900	0.2950	+0.0519
P1020 US midwest transaction	\$/lb	17 Mar	1.2865	1.2974	-0.0029
6061 billet US premium	\$/lb	15 Mar	0.1800	0.2100	nc
6063 billet del US premium	\$/lb	15 Mar	0.1700	0.2000	nc
6063 billet del US transaction	\$/lb	17 Mar	1.4565	1.4974	-0.0029
6063 extrusion premium billet del Italy	\$/t	15 Mar	550	600	nc
6063 extrusion premium billet del Germany	\$/t	15 Mar	550	600	nc
6063 extrusion duty paid premium in-warehouse Rotterdam	\$/t	15 Mar	500	550	nc
P1020 duty paid 3-month premium in-warehouse Rotterdam	\$/t	15 Mar	270	290	nc
P1020 duty paid premium cif Japan forward quarter	\$/t	3 Jan	86	86	na
P1020 duty paid spot premium in-warehouse Rotterdam	\$/t	15 Mar	270	290	nc
P1020 duty unpaid 3-month premium in-warehouse Rotterdam	\$/t	15 Mar	180	200	nc
P1020 duty unpaid spot premium in-warehouse Rotterdam	\$/t	15 Mar	180	200	nc
Aluminium-alloy die castings 12 ADC12 cif Japan	\$/t	16 Mar	2,320	2,350	-15
<b>Copper concentrates TC/RCs, cif China</b>					
	Unit	Timing	Assessment	±	
Smelter purchase treatment charges	\$/dmtu	17 Mar	74.30	0.00	
Smelter purchase refining charges	€/lb	17 Mar	7.43	0.00	
Trader purchase treatment charges	\$/dmtu	17 Mar	64.90	0.00	
Trader purchase refining charges	€/lb	17 Mar	6.49	0.00	
<b>Averages</b>					
Smelter purchase Treatment charges MTD	\$/dmtu	17 Mar	75.37	-0.53	
Smelter purchase Treatment charges monthly average	\$/dmtu	February	78.68	-3.52	
Smelter purchase Refining charges MTD	€/lb	17 Mar	7.54	-0.05	
Smelter purchase Refining charges monthly average	€/lb	February	7.87	-0.35	
Trader purchase treatment charges MTD	\$/dmtu	17 Mar	64.90	0.00	
Trader purchase treatment charges monthly average	\$/dmtu	February	68.10	-3.00	
Trader purchase refining charges MTD	€/lb	17 Mar	6.49	0.00	
Trader purchase refining charges monthly average	€/lb	February	6.81	-0.30	

The standard LME aluminum alloy contract remained unchanged at \$2,007/t, while the North American aluminum alloy contract edged up by 0.9pc to \$2,335/t.



## BASE METALS: MARKET COMMENTARY

### China Cu: TC/RCs stabilise on rising supplies

China's copper concentrate treatment and refining charges (TC/RCs) for smelter purchases held stable this week following last week's fall in response to a recovery on the supply side, with market participants expecting TC/RCs to rise in the near term following output ramp-ups.

The Argus weekly index for smelter purchases was assessed at \$74.30/t and 7.43¢/lb on 17 March, with that for trader purchases at \$64.90/t and 6.49¢/lb, stable from a week ago. Concentrate supplies are increasing as many copper smelters are carrying out equipment overhauls.

#### Production restrictions eased

The Ventanas port in Chile started resuming operations from the second half of February after a major fire on 22 December, with copper concentrate exports from the world's largest copper producer gradually increasing, according to market participants.

Blockades at a key mining highway in the world's second-largest copper producer Peru were temporarily lifted three weeks ago. The highway is a key transport route for Swiss resources firm Glencore's Antapaccay and Chinese firm MMG's Las Bambas mines. It has been blocked by protests against newly-elected Peruvian president Dina Boluarte since January.

"Las Bambas holds around 300,000t of copper concentrate stocks because of intermittent blockades and it is transporting the stocks to ports for exports. Shipments bound to China will recover," a market participant told Argus, expecting supplies to increase.

The Las Bambas copper mine in southern Peru is returning to full capacity after the scale of its operations was reduced in early February as a result of protests and road blockages, the mine's owner MMG said on 13 March.

Canadian mining firm First Quantum and the Panamanian government have reached an agreement over new contract terms. The company and the government were locked in a dispute over revised terms that led to the [23 February shutdown](#) of the Minera Panama copper mine, one of the biggest mines in Latin America. Minera Panama produced 350,000t in 2022, up by 19,000t from 2021.

US mining company Freeport McMoran's Grasberg mine in Indonesia has resumed operations since early March following a production halt caused by heavy rainfall on 11 February. The company said the suspension lowered its production guidance in the first quarter, but has no impact on its long-term plans. The Grasberg mine is one of the largest in the world and produces approximately 2,270 t/d of copper.

#### Output ramp-ups

Many market participants expect feedstock supplies to be sufficient following output expansions at several copper producers and are upbeat about future TC/RCs.

UK-registered mining firm Anglo American's copper output reached 664,000t in 2022, up by 3pc from a year ago. The

Copper cathodes and brass					
	Unit	Timing	Low	High	±
<b>Copper cathode premiums</b>					
Cathode grade A del US midwest	\$/lb	15 Mar	0.0950	0.1100	nc
Cathode grade A del US midwest transaction	\$/lb	17 Mar	4.0085	4.0235	+0.0280
Cathode grade A in-warehouse Rotterdam	\$/t	14 Mar	70.00	100.00	nc
Cathode grade A del southern Europe	\$/t	14 Mar	190.00	220.00	nc
<b>Brass/bronze alloys del US</b>					
C89833	\$/lb	16 Mar	4.5000	4.6000	-0.2000
C89836	\$/lb	16 Mar	4.5500	4.6500	-0.2000
<b>Nickel</b>					
	Unit	Timing	Low	High	±
<b>Europe</b>					
Briquette min 99.8% in-warehouse Rotterdam	\$/t	16 Mar	650.00	700.00	-50.00
Cathode 4x4inch premium in-warehouse Rotterdam	\$/t	16 Mar	650.00	1,150.00	-125.00
Cathode full plate premium in-warehouse Rotterdam	\$/t	16 Mar	250.00	350.00	nc
Cathode full plate in-warehouse Rotterdam transaction	\$/t	17 Mar	23,450.00	23,560.00	+580.00
Cathode 4x4 in-warehouse Rotterdam transaction	\$/t	17 Mar	23,850.00	24,360.00	+580.00
Briquette in-warehouse Rotterdam transaction	\$/t	17 Mar	23,850.00	23,910.00	+580.00
<b>US</b>					
Cathode 4x4inch premium (small lots) del US	\$/lb	16 Mar	1.00	1.10	nc
Cathode 4x4inch premium (truckloads) del US	\$/lb	16 Mar	0.95	1.05	nc
Cathode 4x4inch (truckloads) del US transaction	\$/lb	17 Mar	11.4779	11.5779	+0.2540
Cathode 1x1inch premium (small lots) del US	\$/lb	9 Mar	1.50	1.60	nc
Cathode 1x1inch premium (truckloads) del US	\$/lb	9 Mar	1.40	1.50	nc
Briquette premium del US	\$/lb	16 Mar	0.70	0.75	nc
<b>China</b>					
Cathode full plate premium cif Shanghai	\$/t	16 Mar	300	400	nc
Sulphate min 22% ex-works China excl. VAT USD/t	\$/t	17 Mar	4,875.37	5,003.66	nc
Nickel Sulphate min 22% ex-works China	Yn/t	17 Mar	38,000	39,000	nc
Nickel sulphate min 22% cif China	\$/t	17 Mar	5,000	5,100	nc

Zinc					
	Unit	Timing	Low	High	±
Special high grade in-warehouse Rotterdam premium	\$/t	13 Mar	400.00	450.00	-100.00
Special high grade del US premium	\$/lb	13 Mar	0.3400	0.3800	nc
Special high grade del US transaction	\$/lb	17 Mar	1.6704	1.7104	+0.0313

Lead					
	Unit	Timing	Low	High	±
Ingot primary 99.97% premium del US	\$/lb	14 Mar	0.1800	0.2200	nc
Ingot primary 99.97% del US transaction	\$/lb	17 Mar	1.1178	1.1578	+0.0057

firm's copper production guidance for 2023 stands at 840,000-930,000t, including 530,000-580,000t for its output in Chile and 310,000-350,000t for Peru.

Chinese producer Zijin Mining produced 859,000t of mined copper in 2022, including output from the Kamoa-Kakula complex in the Democratic Republic of Congo (DRC), in which it has an interest, with its 2023 guidance having risen to 950,000t.

Canadian mining firm Teck Resources expects copper production to climb by as much as 65pc in 2023, and more than double

this past year's production from 2024-2026. Teck forecasts its copper production will hit 390,000-445,000t for 2023, up largely from 270,000t in 2022, supported by a ramp-up at its Chilean Quebrada Blanca expansion.

Chinese diversified mineral producer CMOC has lifted its copper output guidance for 2023, mainly because its Kisanfu (KFM) copper-cobalt mine in the DRC is on track to come on line in the first half of 2023. CMOC's 2023 copper guidance has risen to 384,000-447,000t from 276,992t in 2022.

## BASE METALS: MARKET NEWS AND ANALYSIS

### Lygend accelerates nickel output in Indonesia

A nickel pig iron (NPI) production line owned by Chinese major nickel producer Lygend reached its design capacity on 2 March at its industrial park on Obi island in Indonesia's north Maluku.

The line, which uses the rotary kiln electric furnace (RKEF) process, is producing 257.43 t/d of NPI, or 38.23t of nickel metal equivalent. This line belongs to Lygend's HJF production unit, comprising eight RKEF lines, with five of them already in operation and three of these having reached design capacity. Lygend aims to put the remaining three lines into production in the next three months.

The firm's another production unit KPS plans to build 12 RKEF production lines with a combined capacity of 185,000 t/yr of nickel metal equivalent, which are scheduled to start production in the second half of 2024.

Lygend is aiming to build more than 400,000 t/yr nickel metal equivalent of [output capacity](#) at its Obi island industrial park by 2024, including six high-pressure acid leach projects producing mixed hydroxide precipitate (MHP) or nickel sulphate and 20 RKEF lines producing NPI.

Lygend has also signed an initial agreement with South Korean conglomerate Posco to develop a [nickel production project in Indonesia's Sulawesi](#).

The facility will have a nameplate capacity of 120,000 t/yr of nickel metal equivalent for intermediate MHP. The first phase of 60,000 t/yr will start construction this year and start production in 2025, with its annual capacity sufficient to supply the requirements of 1.2mn electric vehicles.

Argus-assessed NPI prices dipped further to 1,200-1,220 yuan metric tonne unit (\$174-177/mtu) on 16 March from Yn1,250-1,260 on 14 March and Yn1,280-1,300/mtu on 9 March, in response to the potential rise in supplies from Indonesia following the launch of new production projects bankrolled by Chinese firms.

### Nexa announces higher Aripuana mine reserves

Brazilian mining company Nexa Resources has announced that mineral reserves in its Aripuana mine have increased.

Lygend Indonesian nickel production units (Ni, Co metal)			
	Ni capacity (t/yr)	Co capacity (t/yr)	Commissioning
NPI by RKEF			
HJF	95,000	N/A	2022-23
KPS	185,000	N/A	2024
MHP/NISO4 by HPAL			
HPL phase 1	37,000	4,500	2021-23
HPL phase 2	18,000	2,250	2023
ONC phase 3	65,000	7,500	2023-24
Total	400,000	14,250	

– Lygend

The mine is located in the state of Mato Grosso and produces zinc, copper, lead, silver and gold.

Following a drilling programme, Nexa has identified an increase in mineral reserves of 8.33mn t, pushing total reserves up to 30.12mn t.

The drilling programme has also extended the life of the mine by three years. Nexa's chief executive Ignacio Rosado said in a statement that Aripuana will reach full plant capacity in the second half of 2023. Zinc is the major output from Aripuana.

Proven and probable mineral reserves, estimated at 30.12mn t, are graded at 3.42pc zinc, 1.25pc lead and 0.17pc copper.

Proven reserves account for 8.41mn t of the total, with zinc reserves estimated at 273,400t, copper at 24,000t and lead at 99,100t.

Probable resources make up 21.71mn t, with zinc forming 755,900t, copper 26,400t and lead 278,600t of the total.

Nexa is among the top five metallic zinc producers globally and operates six mines, three in Peru and three in Brazil. It is currently ramping up Aripuana in order to make it an underground mine, which the other five are.

By Aditya A

### Rusal's profits take hit from sanctions in 2022

Russian aluminium producer Rusal saw earnings and profit fall sharply in 2022, with pressure from sanctions against Russian industry as a result of the invasion of Ukraine forcing

production costs higher for the company.

“Rusal faced unprecedented pressure and restrictions in 2022 owing to the Australian government’s ban on the export of alumina and aluminium ores to Russia, as well as the suspension of alumina production at the Mykolaiv alumina refinery,” Rusal said. “The company had to urgently look for new suppliers and rearrange supply chains, which led to a rise in production costs by 30.2pc.”

Rusal posted earnings before interest, taxes, depreciation and amortisation (ebitda) of \$2.03bn in 2022, down by 29.9pc on the previous year, on revenues that climbed by 16.5pc to \$13.97bn.

Revenues grew thanks to higher realised aluminium prices, which rose by 16.6pc in 2022 from their average over the previous year, against production and sales volumes for the company that **stayed broadly flat**.

Net profit fell by 52.8pc to \$1.54bn last year.

Rusal warned that falling aluminium prices over recent weeks could impair business this year, as production costs remain high.

“A significant increase in interest rates, emerging problems in the banking and financial systems of the US and the EU, coupled with the risk of a slowdown in the global economic recovery, significantly reduce the appetite for risky assets, including in commodity markets,” it said. “This complex of negative factors has a negative impact on the aluminium price.”

The cost of supplying alumina to its smelters under the Australian ban jumped by almost 150pc on the year in 2022 to \$1.85bn, Rusal reported, while bauxite costs fell by over a third owing to the increase in alumina purchasing, reaching \$331mn. The company’s energy costs rose by 28.4pc on the year to \$2.66bn.

Total cost of sales rose by 30.02pc on the year to \$10.77bn, the company said.

### Cyclone Yaku forces halt in Cerro Lindo zinc mine

Brazilian mining company Nexa Resources said that it has suspended production operations at its Cerro Lindo zinc mine in Peru owing to Cyclone Yaku, which has unleashed torrential rains in the country.

Heavy downpours have caused an overflow of rivers in the region and Cerro Lindo’s underground mining area has been flooded. The company said lower levels of the mine

have been affected as more water reached the underground than could be pumped to the surface. Road access has also been disrupted.

Nexa said it aims to resume production in 10-12 days provided that it manages to clear its underground site of water. It is currently reviewing its production guidance for 2023.

Cerro Lindo produces approximately 233t of zinc a day.  
*By Aditya A*

### LME Ni trading in Asian hours postponed by a week

The London Metal Exchange (LME) has deferred the resumption of nickel trading in Asian hours by a week after it found irregularities in nickel cargo supplied to one of its warehouses.

The LME announced last month that nickel trading would reopen in Asian hours **on March 20** after it was suspended in March 2022 due to a short squeeze that led benchmark nickel prices to soar above \$100,000/t.

The exchange said today that the reopening has been postponed to March 27 after it invalidated nine nickel warrants in an unspecified warehouse registered with the exchange that did not meet contract specifications.

The anomalous warrants related to bagged nickel briquettes and were uncovered by the weight of the bags, among other factors. The exchange reiterated the requirement for its licensed warehouses to weigh all metal before placing them on warrant.

The LME said no other warrants in the facility in question have been affected, nor in any other global facilities. It has asked its warehouses to undertake relevant inspections on warranted nickel.

No other contracts traded on the LME allow bagged delivery and are not vulnerable to such irregularities, the exchange added.

The LME decided to postpone the resumption of nickel trading in Asian hours to the following week in order to give its participants time to conduct inspections of their own nickel stocks.

Even though the invalidated contracts make up only 0.14pc of live nickel stock, the LME is exercising extreme caution in the wake of a \$577mn loss faced by global commodity trading group Trafigura in a **nickel delivery scandal** that came to light last month.

*Aditya A*

## FERRO ALLOYS: NEWS AND ANALYSIS

### Softening steel demand to weigh on China's FeMo

China's ferro-molybdenum prices are expected by market participants to fall in the coming week with subdued demand from the steel industry.

Argus assessed domestic prices for 60pc grade alloy at 275,000-285,000 yuan/t (\$39,914-41,365/t) ex-works on 17 March, or Yn458-475/kg for contained molybdenum, down by Yn5,000/t from 16 March following reduced buying interest and a fall in tender prices from steel mills.

Chinese steel producers have purchased around 4,500t of the noble alloy so far in March, much lower than market participants' expectations, compared with around 16,000t a year earlier. Most tender prices were done at around Yn275,000/t delivered and paid by acceptance bill on 17 March.

Most steel producers are eager to press down alloy purchase costs by reducing tender volumes and raising the purchasing frequency from once or twice a month to once or twice a week. State-owned steel producer Shougang bought 10t of the alloy at Yn276,000/t paid by acceptance bill, down by Yn26,000/t from a tender it issued earlier this week. Taiyuan Iron and Steel purchased 60t at Yn274,900/t paid by acceptance bill, down by Yn19,600/t from earlier this week.

Demand from overseas market has yet to show any sign of recovery, which has dented market sentiment. "We are still uncertain about our schedule for alloy replenishments in the short term," an Indonesia-based stainless steel producer told Argus. It usually purchases around 400 t/month but has yet to buy the alloy this year.

A number of alloy smelters have started equipment maintenance considering thin profit margins and subdued demand from the steel sector, with some alloy producers inclined to

wait for bids from buyers rather than making offers proactively that could cause prices to fall. Major mining companies have postponed concentrate sales from early this month to late this month but the delays have failed to support the market.

Several market participants expect steel mills to boost alloy purchases to maintain their steel production later this month because of reduced steel inventories. But downbeat market sentiment has prompted some alloy smelters and concentrate trading firms to increase sales to take profits. This is likely to exert downwards pressure on the market in the coming week.

### OMC receives mixed response to Cr ore tender

India's Odisha Mining (OMC) has received a mixed response to its March chrome ore tender, with 81,000t still unsold at the time of writing, as lower ferro-chrome demand knocks on to ore intakes.

OMC on Thursday offered 32,200t of friable chrome ore with 42-54pc of Cr2O3 content from its South Kaliapani and Sukrangi mines via state-owned trading firm MSTC. So far, ore above 48pc grade from South Kaliapani has attracted bids higher than its base price of 17,658 rupees/t (\$213.90/t). Ore lower than 48pc grade has received bids near OMC's base prices. OMC has not offered any 50-51.99pc-grade ore from its Sukrangi mines in the tender.

Of the 32,200t offered, about 81,000t of lower-grade ore remains unsold, according to market participants.

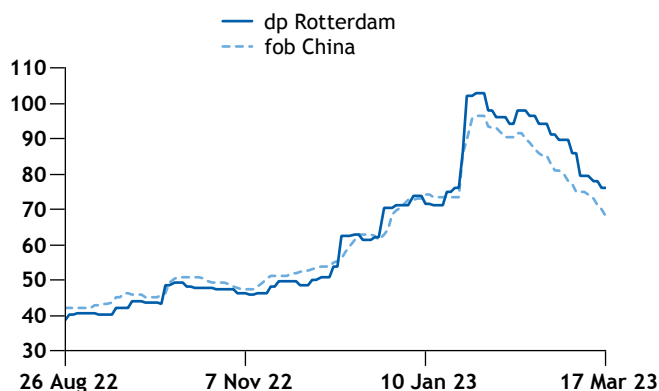
Ore demand remains under pressure from weakness further downstream in the ferro-chrome and stainless steel markets. Domestic prices for 60pc-grade ferro-chrome fell further on Thursday, falling to Rs114,000-115,000/t ex-works from Rs114,000-116,000/t ex-works on 15 March in thin spot trade. Prices are unlikely to find support ahead of 31 March, as most Indian end-users typically aim to have low inventories at the end of the fiscal year. Chinese buying interest is also yet to revive, meaning Indian ferro-chrome suppliers are unable to shift excess tonnes towards the export market.

Truck drivers in Odisha state have gone on an indefinite strike from 15 March, demanding social security measures and the formation of a welfare fund. Odisha is India's largest chrome ore mining state and a major supplier of feedstock to ferro-chrome plants. Market participants are closely monitoring the situation, warning that ferro-chrome plants might face disruptions if the strike action continues beyond a few days.

By Samil Surendran

### Ferro-molybdenum China vs Rotterdam

\$/kg



Twice-weekly bulk alloy and feedstock prices							
Market	Unit	17 Mar		± 14 Mar	14 Mar		± 9 Mar
		Low	High		Low	High	
<b>Ferro-chrome</b>							
HC basis 60-64.99% Cr 6-8% C ddp NWE	\$/lb Cr	1.45	1.60	nc	1.45	1.60	nc
HC min 65% Cr 6-8% C ddp NWE	\$/lb Cr	2.40	2.58	nc	2.40	2.58	nc
LC Cr min 65% 0.10% C ddp Europe works	\$/lb Cr	3.30	3.90	nc	3.30	3.90	nc
LC 60-64.99% Cr. 0.10pc C ddp Europe works (per lb Cr)	\$/lb Cr	2.80	3.05	nc	2.80	3.05	nc
HC 50% Cr ex-works China	Yn/t	9,000	9,300	nc	9,000	9,300	nc
HC 50% Cr ex-works China USD/lb	\$/lb	1.05	1.08	nc	1.05	1.08	nc
HC min 60% Cr ex-works India	Rs/t	114,000	115,000	nc	114,000	115,000	-500
Charge chrome 50-55% Cr 6-10% C cif China	\$/lb	1.07	1.08	nc	1.07	1.08	nc
HC Indian 60-62% Cr 6-10% C cif China	\$/lb	1.07	1.08	nc	1.07	1.08	nc
HC Kazakh 65-70% Cr 6-8% C cif China	\$/lb	1.14	1.16	nc	1.14	1.16	nc
<b>Chrome ore</b>							
Ore South African concentrate 42-44% Cr <sub>2</sub> O <sub>3</sub> cif China	\$/t	320	325	nc	320	325	nc
Ore South African concentrate 42-44% Cr <sub>2</sub> O <sub>3</sub> fca China	Yn/mtu	58.00	59.00	nc	58.00	59.00	nc
Ore Turkish lump 40-42% cif China	\$/t	315	320	nc	315	320	nc
Ore Turkish lump 40-42% fca China	Yn/mtu	63.00	64.00	nc	63.00	64.00	nc
Ore South African UG2 concentrate 40-42% Cr <sub>2</sub> O <sub>3</sub> cif China main ports	\$/t	290	295	nc	290	295	nc
Ore South African UG2 concentrate 40-42% Cr <sub>2</sub> O <sub>3</sub> fca China ports	Yn/mtu	55.50	56.50	nc	55.50	56.50	nc
<b>Ferro-manganese</b>							
HC Mn 78% ddp Europe works	€/t	1,090	1,200	nc	1,090	1,200	nc
HC 65% Mn ex-works China	Yn/t	6,500	6,700	nc	6,500	6,700	nc
HC 75% Mn ex-works China	Yn/t	7,600	7,800	nc	7,600	7,800	nc
HC min 65-70% Mn ex-works India	Rs/t	73,000	74,000	nc	73,000	74,000	nc
HC min 70-75% Mn ex-works India	Rs/t	76,000	77,000	nc	76,000	77,000	nc
<b>Manganese ore</b>							
Ore 44-46% lumpy ore fca China	Yn/mtu	45.50	47.50	nc	45.50	47.50	-0.50
<b>Silico-manganese</b>							
65% Mn ddp Europe works	€/t	1,100	1,200	nc	1,100	1,200	nc
65% Mn 17% Si ex-works China	Yn/t	7,100	7,250	nc	7,100	7,250	-50
60% Mn 14% Si ex-works India	Rs/t	74,000	75,000	nc	74,000	75,000	nc
65% Mn 15% Si fob India East Coast	\$/t	1,040	1,060	nc	1,040	1,060	nc
60% Mn 14% Si fob India East Coast	\$/t	930	940	nc	930	940	nc
<b>Ferro-silicon</b>							
75% Si ddp NWE	€/t	1,870	2,050	nc	1,870	2,050	nc
72% Si fob China	\$/t	1,520	1,570	nc	1,520	1,570	nc
72% Si ex-works China	Yn/t	7,500	7,700	nc	7,500	7,700	nc
75% Si fob China	\$/t	1,590	1,640	nc	1,590	1,640	nc
75% Si ex-works China	Yn/t	7,900	8,000	nc	7,900	8,000	nc
Low aluminium 75% Si 0.1% Al fob China	\$/t	1,850	1,900	nc	1,850	1,900	nc
Low aluminium 75% Si 0.5% Al fob China	\$/t	1,750	1,800	nc	1,750	1,800	nc
75% Si ex-works India	Rs/t	117,000	120,000	nc	117,000	120,000	nc

\* Quarterly benchmark price



Twice-weekly noble-alloy and feedstock prices							
	Unit	17 Mar			14 Mar		
		Low	High	± 14 Mar	Low	High	± 9 Mar
<b>Ferro-molybdenum</b>							
65-70% Mo dp Rotterdam	\$/kg Mo	75.00	77.00	nc	75.00	77.00	-2.00
60% Mo fob China	\$/kg	67.00	69.00	-2.00	69.00	71.00	-1.00
60% Mo ex-works China	Yn/t	275,000	285,000	-5,000	280,000	290,000	-10,000
60% Mo ex-works India	Rs/kg	3,600	3,650	nc	3,600	3,650	-100
<b>Ferro-niobium</b>							
min 65% Nb du Rotterdam	\$/kg Nb	47.75	50.00	nc	47.75	50.00	nc
<b>Ferro-tungsten</b>							
min 75% W du Rotterdam	\$/kg W	38.50	39.50	nc	38.50	39.50	-0.50
<b>Ferro-titanium</b>							
Russian min 70% Ti du Rotterdam	\$/kg Ti	6.20	6.90	nc	6.20	6.90	-0.15
min 70% Ti dp/duty-free Rotterdam	\$/kg Ti	8.00	8.50	nc	8.00	8.50	nc
UK min 70% Ti ex-works	\$/kg Ti	8.30	8.80	nc	8.30	8.80	nc
<b>Titanium</b>							
Turnings 90/6/4 max 0.5% Sn ddp UK	\$/lb	2.05	2.20	nc	2.05	2.20	nc
<b>Ferro-vanadium</b>							
78-82% V dp Rotterdam	\$/kg V	39.60	41.00	nc	39.60	41.00	nc
50% V ex-works China	Yn/t	141,000	143,000	nc	141,000	143,000	-1,500
80% V fob China	\$/kg	38.50	40.50	nc	38.50	40.50	-0.50
50% V ex-works India	Rs/kg	1,750	1,800	nc	1,750	1,800	nc
<b>Vanadium-nitrogen alloy</b>							
Vanadium-nitrogen alloy 77% V 18% N ex-works China	Yn/t	197,000	199,000	nc	197,000	199,000	nc

Twice-weekly nickel prices							
Market	Unit	17 Mar			14 Mar		
		Low	High	± 14 Mar	Low	High	± 9 Mar
<b>Nickel</b>							
Ore min 1.8% Ni fca China	Yn/wmt	780	800	nc	780	800	-40.0
Pig iron min 10% ex-works China	Yn/mtu	1,200	1,220	nc	1,200	1,220	-45.0

Monthly price assessments							
Market	Unit	Latest			±	Previous	
		Low	High	Low		High	
<b>Ferro-boron</b>							
17% B fob US warehouse	\$/lb	2.50	3.00	nc	2.50	3.00	
<b>Ferro-chrome</b>							
Charge chrome fob US warehouse	\$/lb	1.25	1.35	nc	1.25	1.35	
<b>Ferro-manganese</b>							
MC 80% Mn 1-2% C fob North America warehouse	\$/lb	1.35	1.40	nc	1.35	1.40	
<b>Ferro-niobium</b>							
65% Nb fob US warehouse	\$/lb	22.50	23.00	nc	22.50	23.00	
<b>Ferro-tungsten</b>							
75% W fob North America warehouse	\$/lb	20.00	20.50	+0.25	19.50	20.50	
<b>Cobalt-Nickel</b>							
Nickel-Cobalt refinery scrap nickel contained del US processor	\$/lb	4.50	5.00	-0.40	4.90	5.40	
<b>Chrome Ore</b>							
Ore Cr <sub>2</sub> O <sub>3</sub> 48-49.99% (South Kaliapani mines) OMC price ex-works India	Rs/t	18,285	18,285	nc	18,285	18,285	
Ore Cr <sub>2</sub> O <sub>3</sub> 50-52% (Sukrangi mines) OMC price ex-works India	Rs/t	19,906	19,906	nc	19,906	19,906	

Weekly price assessments						
Market	Unit	16 Mar			9 Mar	
		Low	High	±	Low	High
<b>Ferro-chrome</b>						
HC min 62% Cr 6-8% C fob US warehouse	\$/lb Cr	2.90	3.00	nc	2.90	3.00
LC min 65% Cr 0.05% C max 1.5% Si fob US warehouse	\$/lb Cr	5.30	5.45	nc	5.30	5.45
LC min 65% Cr 0.10% C max 1.5% Si fob US warehouse	\$/lb Cr	3.80	4.30	nc	3.80	4.30
LC 60% Cr 0.15% C fob US warehouse	\$/lb	3.70	4.20	nc	3.70	4.20
<b>Ferro-manganese</b>						
HC 75% fob China (14 Mar)	\$/t	1,420	1,450	-40	1,460	1,490
HC min 80% Mn 6-8% C fob North America warehouse	\$/t	1,450	1,500	nc	1,450	1,500
MC 78% Mn 1.5-2% C 0.15-0.20 P ddp Europe works (14 Mar)	€/t	1,645	1,820	-40	1,685	1,860
<b>Manganese ore</b>						
Ore 36-38% Mn cif China	\$/dmu	4.45	4.60	-0.10	4.55	4.70
Ore 48-50% Mn cif China	\$/dmu	5.55	5.65	-0.05	5.60	5.70
Ore 44-46% Mn cif China	\$/dmu	5.85	5.95	-0.05	5.90	6.00
<b>Silico-manganese</b>						
65% Mn 17% Si fob China (14 Mar)	\$/t	1,320	1,350	-10	1,330	1,360
min 65% Mn 16% Si fob North America warehouse	\$/lb	0.71	0.75	nc	0.71	0.75
<b>Ferro-silicon</b>						
min 75% Si max 0.1% C fob US warehouse	\$/lb Si	1.300	1.400	-0.050	1.350	1.450
<b>Calcium-silicon</b>						
min 28% Ca 55-60% Si fob China	\$/t	1,730	1,760	nc	1,730	1,760
min 28% Ca 55-60% Si ex-works China	Yn/t	11,500	11,800	nc	11,500	11,800
min 30% Ca 55-60% Si fob China	\$/t	1,760	1,790	nc	1,760	1,790
min 30% Ca 55-60% Si ex-works China	Yn/t	11,700	12,000	nc	11,700	12,000
<b>Ferro-molybdenum</b>						
min 65% Mo max 1.5% Si fob North America warehouse	\$/lb Mo	37.000	39.000	nc	37.000	39.000
<b>Ferro-niobium</b>						
min 66% Nb Brazilian Imports fca China port (14 Mar)	Yn/t	222,000	225,000	nc	222,000	225,000
<b>Ferro-tungsten</b>						
75% W ex-works China (14 Mar)	Yn/t	181,000	182,000	nc	181,000	182,000
min 75% W fob China (14 Mar)	\$/kg	36.00	37.00	nc	36.00	37.00
<b>Ferro-titanium</b>						
30% Ti ex-works China (14 Mar)	Yn/t	13,000	13,500	nc	13,000	13,500
70% scrap grade ex-works China (14 Mar)	Yn/t	29,500	33,000	nc	29,500	33,000
70% Ti fob North America warehouse	\$/lb	4.10	4.15	nc	4.10	4.15
<b>Titanium</b>						
Scrap min 85% Ti tin-bearing mixed turnings del US dealer/processor	\$/lb	1.20	1.30	nc	1.20	1.30
Scrap min 85% Ti non-tin-bearing mixed turnings del US dealer/processor	\$/lb	1.25	1.35	nc	1.25	1.35
<b>Ferro-vanadium</b>						
78-82% V max 1.5% Si fob North America warehouse	\$/lb V	18.90	19.10	nc	18.90	19.10
<b>Nickel</b>						
Ore min 1.8% Ni fca China (17 Mar)	Yn/wmt	780	800	nc	780	800
<b>Stainless steel</b>						
Stainless steel scrap 304 (18-8) solids cif Rotterdam	\$/lb	0.689	0.698	-0.024	0.710	0.724
Stainless steel scrap 304 (18-8) solids cif Japan	\$/lb	0.66	0.67	nc	0.66	0.67
Stainless steel scrap 304 (18-8) solids cif South Korea	\$/lb	0.68	0.70	nc	0.68	0.70
Stainless steel scrap 304 (18-8) solids cif Taiwan	\$/lb	0.68	0.69	nc	0.68	0.69
Stainless steel scrap 409/410 solids del US processor	\$/t	426	448	nc	426	448
Stainless steel scrap 430 solids del US processor	\$/t	538	560	+22	515	538

RARE EARTHS: NEWS AND ANALYSIS

**Baotou targets 170,000t magnet capacity in 2023**

Baotou city in north China’s Inner Mongolia region has accelerated its development of the rare earth permanent magnetic materials industry to meet firmer downstream demand, with magnet output capacity forecast at 170,000t in 2023 and actual output at 100,000t in 2025.

Baotou currently has capacity to produce 48,000 t/yr of rare earth metals, 67,000 t/yr of magnetic materials, 18,000 t/yr of rare earth catalysts and 1.8mn t of rare earth alloys. The targeted capacity of 170,000t is estimated to account for over 30pc of the country’s total capacity this year, some market participants said.

A number of large-scale magnet manufacturing plants have started building new facilities in Baotou with booming consumer demand and sufficient domestic rare earth feedstock supplies.

Chinese rare earths permanent magnet manufacturer Ningbo Yunsheng is building a 15,000 t/yr output capacity of high-performance sintered neodymium-iron-boron (NdFeB) magnets in Baotou, with a total investment of 1.1bn yuan (\$160mn). The project is forecast to start operations in 2024.

The first phase of 8,000 t/yr of high-performance rare earth permanent magnetic materials at major Chinese magnet manufacturing plant Jinli Magnet’s facility in Baotou came on stream in June 2022. Its second 12,000 t/yr phase is projected to be commissioned this year.

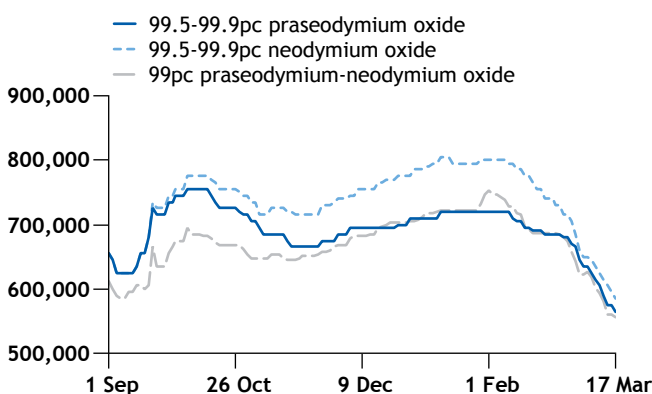
Fellow rare earth permanent magnetic materials producer Earth-Panda Advanced finished construction for a 5,000 t/yr high-performance rare earth magnets plant in Baotou city in December last year and began partial trial operations in late January this year.

Earth-Panda registered a 28.1pc year-on-year rise in its 2022 revenues of Yn2.119bn, with profit falling by 3.29pc to Yn147mn.

Magnet manufacturer Ningbo Ketian Magnet has started the first phase of magnet production project in Baotou, with the second phase expected in 2024. The design capacity of the two phases will reach 8,000 t/yr for rare earth permanent magnets. Ningbo Ketian, which is a subsidiary of China’s largest non-ferrous metal manufacturer Ningbo Jintian Copper, is involved in the research, production, application and development of high-performance sintered NdFeB permanent magnetic materials. It said on 30 January that it likely achieved a 39.29-47.38pc fall in its 2022 profits to Yn390-450mn, in response to weaker sales and rising production costs caused by the impact of Covid-19 lockdown restrictions.

Baotou Jinshan Magnetic Materials, located in the Baotou rare earths Hi-tech district industrial park, is operating its 5,000 t/yr output capacity of high-performance NdFeB magnets, which are used in the new energy vehicle, wind turbine, servo motor and elevator tractor sectors.

Praseodymium and neodymium ex-works China Yn/t

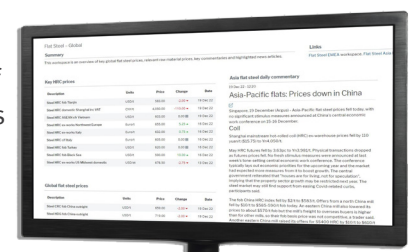


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Current week prices in full						
China export and delivered Europe prices						
Element	units	Date	Low	High	± Date	±
<b>Cerium</b>						
Carbonate min 45% REO fob China	\$/kg	1 Mar	0.40	0.50	1 Feb	nc
Metal min 99.9% C 0.03% max. Fe 0.2% max fob China	\$/kg	17 Mar	7.20	7.40	16 Mar	nc
Metal min 99% fob China	\$/kg	17 Mar	5.70	6.00	16 Mar	nc
Oxide 99.5-99.9% fob China	\$/t	17 Mar	1,150	1,200	16 Mar	nc
Oxide 99.5-99.9% cif Europe	\$/kg	1 Mar	1.55	2.00	1 Feb	-0.22
<b>Dysprosium</b>						
Metal min 99% fob China	\$/kg	17 Mar	374	381	16 Mar	nc
Dysprosium oxide min 99.5% fob China	\$/kg	17 Mar	284	289	16 Mar	nc
Oxide min 99.5% cif Europe	\$/kg	1 Mar	320	340	1 Feb	-40
<b>Europium</b>						
Metal min 99.9% fob China	\$/kg	1 Mar	265	275	1 Feb	nc
Oxide min 99.99% fob China	\$/kg	1 Mar	25.50	28.50	1 Feb	nc
<b>Erbium</b>						
Oxide min 99.5% cif Europe	\$/kg	1 Mar	44.00	46.00	1 Feb	-5.00
<b>Ferro-dysprosium</b>						
min 80% Dy fob China	\$/kg	17 Mar	282	287	16 Mar	nc
<b>Gadolinium</b>						
Metal min 99% fob China	\$/kg	17 Mar	70.00	76.00	16 Mar	-2.00
Oxide min 99.99% fob China	\$/t	17 Mar	43,000	46,000	16 Mar	-1,000
Oxide min 99.999% fob China	\$/t	17 Mar	49,000	53,000	16 Mar	nc
<b>Holmium</b>						
Oxide min 99.5% fob China	\$/t	17 Mar	86,000	90,000	16 Mar	nc
<b>Lanthanum</b>						
Metal min 99% fob China	\$/kg	17 Mar	5.50	5.80	16 Mar	nc
Metal min 99.9% C 0.03% max. Fe 0.2% max fob China	\$/kg	17 Mar	7.20	7.40	16 Mar	nc
Oxide 99.5-99.9% fob China	\$/t	17 Mar	1,100	1,150	16 Mar	nc
Oxide min 99.999% fob China	\$/kg	17 Mar	4.50	4.70	16 Mar	nc
<b>Lutetium</b>						
Oxide min 99.99% fob China	\$/kg	14 Mar	850	865	7 Mar	nc
<b>Mischmetal</b>						
35% La 65% Ce fob China	\$/kg	1 Mar	5.30	5.60	1 Feb	nc
Low Zn and Mg fob China	\$/kg	1 Mar	24	27	1 Feb	nc
<b>Neodymium</b>						
Metal min 99% fob China	\$/kg	17 Mar	102.50	103.50	16 Mar	-0.80
Oxide 99.5-99.9% fob China	\$/t	17 Mar	85,000	86,000	16 Mar	-800
Metal 99% cif Europe	\$/kg	1 Mar	135.00	140.00	1 Feb	-10.00
Oxide 99.5-99.9% cif Europe	\$/kg	1 Mar	105.00	110.00	1 Feb	-14.50
<b>Praseodymium</b>						
Metal min 99% fob China	\$/kg	17 Mar	108.00	109.00	16 Mar	-1.00
Oxide 99.5-99.9% fob China	\$/t	17 Mar	82,000	83,000	16 Mar	-1,000
<b>Praseodymium-Neodymium</b>						
Metal min 99% fob China	\$/kg	17 Mar	97.30	98.30	16 Mar	-0.20
Praseodymium-Neodymium oxide min 99% fob China	\$/t	17 Mar	80,800	81,800	16 Mar	-500
<b>Samarium</b>						
Metal min 99% fob China	\$/kg	17 Mar	12.20	12.70	16 Mar	nc
Oxide min 99.5% fob China	\$/kg	17 Mar	2.08	2.33	16 Mar	nc
<b>Terbium</b>						
Metal min 99.9% fob China	\$/kg	17 Mar	1,800	1,820	16 Mar	-30
Oxide min 99.99% fob China	\$/kg	17 Mar	1,420	1,440	16 Mar	-20
Oxide min 99.99% cif Europe	\$/kg	1 Mar	1,800	2,000	1 Feb	-160
<b>Ytterbium</b>						
Oxide min 99.99% fob China	\$/t	14 Mar	11,700	13,900	7 Mar	nc
<b>Yttrium</b>						
Metal min 99.9% fob China	\$/kg	14 Mar	32.00	34.50	7 Mar	nc
Oxide min 99.999% fob China	\$/t	17 Mar	8,000	8,500	16 Mar	nc
Oxide 99.999% cif Europe	\$/kg	1 Mar	8.20	8.70	1 Feb	-0.55

China domestic ex-works prices						
Element	units	Date	Low	High	± Date	±
<b>Cerium</b>						
Carbonate min 45% REO ex-works	Yn/t	1 Mar	2,700	3,200	1 Feb	nc
Metal min 99.9% C 0.03% max. Fe 0.2% max ex-works	Yn/t	17 Mar	41,000	43,000	16 Mar	nc
Metal min 99% ex-works	Yn/t	17 Mar	27,000	29,000	16 Mar	nc
Oxide 99.5-99.9% ex-works	Yn/t	17 Mar	6,500	7,000	16 Mar	nc
<b>Dysprosium</b>						
Metal min 99% ex-works	Yn/kg	17 Mar	2,570	2,620	16 Mar	nc
Oxide min 99.5% ex-works	Yn/kg	17 Mar	1,950	1,970	16 Mar	nc
<b>Erbium</b>						
Oxide min 99.5% ex-works	Yn/t	17 Mar	260,000	265,000	16 Mar	nc
<b>Europium</b>						
Oxide min 99.99% ex-works	Yn/kg	1 Mar	175	185	1 Feb	nc
<b>Ferro-dysprosium</b>						
min 80% Dy ex-works	Yn/kg	17 Mar	1,940	1,960	16 Mar	nc
<b>Ferro-gadolinium</b>						
min 75% Gd ex-works	Yn/t	17 Mar	245,000	255,000	16 Mar	-5,000
<b>Gadolinium</b>						
Metal min 99% ex-works	Yn/t	17 Mar	460,000	490,000	16 Mar	-10,000
Oxide 99.5-99.9% ex-works	Yn/t	17 Mar	265,000	270,000	16 Mar	-5,000
Oxide min 99.99% ex-works	Yn/t	17 Mar	285,000	300,000	16 Mar	-2,500
<b>Holmium</b>						
Oxide min 99.5% ex-works	Yn/t	17 Mar	580,000	600,000	16 Mar	nc
<b>Lanthanum</b>						
Metal min 99% ex-works	Yn/t	17 Mar	26,000	28,000	16 Mar	nc
Metal min 99.9% C 0.03% max. Fe 0.2% max ex-works	Yn/t	17 Mar	41,000	43,000	16 Mar	nc
Oxide min 99.999% ex-works	Yn/t	17 Mar	22,000	24,000	16 Mar	nc
Oxide 99.5-99.9% ex-works	Yn/t	17 Mar	6,100	6,600	16 Mar	nc
Ce chloride min 45% REO ex-works	Yn/t	1 Mar	2,000	2,500	1 Feb	nc
<b>Lutetium</b>						
Oxide min 99.99% ex-works	Yn/kg	14 Mar	5,800	5,900	7 Mar	nc
<b>Mischmetal</b>						
35% La 65% Ce ex-works	Yn/t	1 Mar	26,000	27,000	1 Feb	nc
Low Zn and Mg ex-works	Yn/t	1 Mar	160,000	180,000	1 Feb	nc
<b>Neodymium</b>						
Metal min 99% ex-works	Yn/t	17 Mar	700,000	710,000	16 Mar	-10,000
Oxide 99.5-99.9% ex-works	Yn/t	17 Mar	580,000	590,000	16 Mar	-10,000
<b>Praseodymium</b>						
Metal min 99% ex-works	Yn/t	17 Mar	740,000	750,000	16 Mar	-10,000
Oxide 99.5-99.9% ex-works	Yn/t	17 Mar	560,000	570,000	16 Mar	-10,000
<b>Praseodymium-Neodymium</b>						
Metal min 99% ex-works	Yn/t	17 Mar	665,000	675,000	16 Mar	-5,000
Oxide min 99% ex-works	Yn/t	17 Mar	553,000	558,000	16 Mar	-5,000
<b>Samarium</b>						
Metal min 99% ex-works	Yn/t	17 Mar	85,000	88,000	16 Mar	nc
Oxide min 99.5% ex-works	Yn/t	17 Mar	14,000	16,000	16 Mar	nc
<b>Terbium</b>						
Metal min 99.9% ex-works	Yn/kg	17 Mar	12,300	12,400	16 Mar	-200
Oxide min 99.99% ex-works	Yn/kg	17 Mar	9,650	9,750	16 Mar	-150
<b>Ytterbium</b>						
Oxide min 99.99% ex-works	Yn/t	14 Mar	80,000	95,000	7 Mar	nc
<b>Yttrium</b>						
Metal min 99.9% ex-works	Yn/kg	14 Mar	210.00	225.00	7 Mar	nc
Oxide min 99.999% ex-works	Yn/t	17 Mar	48,000	50,000	16 Mar	nc



\*Additional user fees apply for real-time LME and COMEX data



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